Ohio Department of Health

Sanitary Chemistry Section

Environmental Sample Submission Report

Agency: OEPA

Division Program: WW20 V

Analysis Reported To: ☐ CO ☐ CDO ☐ SE ☒ NE ☐ SW ☐ NW

Laboratory: ☐ Central ☐ SE ☐ NE ☐ SW ☐ NW

Sample Number: 33296

Analyst: _____ Supervisor: Williams

Date Received: 8-8-80

Date Reported: 9-9-80

Sample Identification

Station: CET Run-OFF #2

ID Number: SC, _ _ _ _ _ _ _ _,

Address: _____

City: _____ Zip: _____

County: Ashtabula Phone: _____

Collected By: SKOWRONSKI - Buda

Grab Sample Date or Beginning Date of Composite Sample—Use Military Time

Year	Month	Day	Hour	Minute
80	08	07	14	45

Ending Date of Composite Sample—Use Military Time

Year	Month	Day	Hour	Minute	CVT	S/T	TYP

Field Treatment:

☐ Filtered ☒ $CuSO_4 + H_3PO_4$

☒ Iced ☐ H_2SO_4

☐ NaOH ☒ HNO_3

☐ Other (Explain)

Additional Information—Analyst Remarks—Non Routine Analytical Requests

US EPA RECORDS CENTER REGION 5

557708

(c)

☐ Sample Code	P115,	☐ Conductivity, Field, U-MHO	P94,	☐ Chlorine Total Resd mg/l	P50060,
☐ pH, Field S.U.	P400,	☐ Flow, Instantaneous CFS	P61,	☐ Water Temperature, Field	P10,
☐ Dissolved Oxygen, Field mg/l	P300,	☐ Hydrogen Sulfide mg/l	P71875,	☐ Sample Purpose	P71999,
☐ Stream Gage	P65,	☐ Chlorine Free Avl, Field mg/l	P50064,	☐	

☐ Regular (or indicate by checking boxes)		☐ Phosphorus Sol, P mg/l	P666,	☐ Lithium Total, Li ug/l	P1132,
☐ Turbidity FTU	P76,	☐ Phosphate Reactive P mg/l	P70507,	☒ Manganese Total, Mn ug/l	P1055, 5500
☐ Color Pt-Co	P80,	☐ Chloride, Cl mg/l	P940,	☒ Mercury Total, Hg ug/l	P71900, <0.5
☒ ~~Conductivity at 25°C U MHO~~	~~P95,~~	☐ Fluoride Total, F mg/l	P951,	☐ Molybdenum Total, Mo ug/l	P1062,
☒ ~~pH, Lab S.U.~~	~~P403,~~	☐ Cyanide,CN mg/l	P720,	☒ Nickel Total, Ni ug/l	P1067, 200
☐ pH, $CaCO_3$ Stability S.U.	P70311,	☐ Silica, Diss. Si mg/l	P955,	☐ Selenium Total, Se ug/l	P1147,
☐ Alkalinity Total, $CaCO_3$ mg/l	P410,	☐ Calcium Total, Ca mg/l	P916,	☐ Silver Total, Ag ug/l	P1077,
☐ Alkalinity Phth, $CaCO_3$ mg/l	P415,	☐ Magnesium Total, Mg mg/l	P927,	☒ Strontium Total, Sr ug/l	P1082, 700
☐ Alkalinity $CaCO_3$ Stabl, mg/l	P74023,	☐ Sodium Total, Na mg/l	P929,	☐ Thallium Total, Tl ug/l	P1059,
☐ Acidity Total, $CaCO_3$ mg/l	P70508,	☐ Potassium Total, K mg/l	P937,	☐ Tin Total, Sn ug/l	P1102,
☐ Acidity M.O. $CaCO_3$ mg/l	P436,	☐ Aluminum Total, Al ug/l	P1105,	☐ Titanium Total, Ti ug/l	P1152,
☐ Hardness Total, $CaCO_3$ mg/l	P900,	☐ Antimony Total, Sb ug/l	P1097,	☐ Vanadium Total, V ug/l	P1087,
☐ Residue, Total mg/l	P500,	☐ Arsenic Total, As ug/l	P1002,	☒ Zinc Total, Zn ug/l	P1092, 350
☐ Residue, Total Volatile mg/l	P505,	☐ Barium Total, Ba ug/l	P1007,	☐ Carbon Total, Organic C mg/l	P680,
☐ Residue, Total Nfilt (Sus) mg/l	P530,	☐ Berylium Total, Be ug/l	P1012,	☐ Carbon Diss, Organic C mg/l	P681,
☐ Residue, Vol, Nfilt mg/l	P535,	☐ Bismuth Total, Bi ug/l	P1017,	☒ Phenol ug/l	P32730, 4
☒ ~~Residue, Total Filt (Diss) mg/l~~	~~P70300,~~	☐ Boron Total, B ug/l	P1022,	☐ MBAS mg/l	P38260,
☐ Residue, Vol Filt mg/l	P520,	☒ Cadmium Total, Cd ug/l	P1027, <5	☐ Oil-Grease, Total mg/l	P556,
☐ Residue, Settlable ml/l	P545,	☒ Chromium Total, Cr ug/l	P1034, 30	☐ BOD, 5-Day mg/l	P310,
☐ Sulfate, SO_4 mg/l	P945,	☐ Chromium Hex, Cr ug/l	P1032,	☐ COD mg/l	P335,
☐ Nitrogen TKN, N mg/l	P625,	☐ Cobalt Total, Co ug/l	P1037,	☐ TOD mg/l	P343,
☐ Nitrogen Ammonia, N mg/l	P610,	☒ Copper Total, Cu ug/l	P1042, 50	☐	
☐ Nitrate-Nitrite, N mg/l	P620,	☒ Iron Total, Fe ug/l	P1045, 23500	☐	
☐ Nitrite, N mg/l	P615,	☐ Iron Diss., Fe ug/l	P1046,	☐	
☐ Phosphorus Total, P mg/l	P665,	☒ Lead Total, Pb ug/l	P1051, 6	☐	

Distribution: 1—Data Processing 2—Central Office 3—District Office 4—Owner 5—Laboratory

Ohio Department of alth

Sanitary Chemistry Section

Environmental Sample Submission Report

Agency: OEPA
Division Program: WW20 V
Analysis Reported To: ☐ CO ☐ CDO ☐ SE ☒ NE ☐ SW ☐ NW

Laboratory: ☐ Central ☐ SE ☐ NE ☐ SW ☐ NW
Sample Number: 33297
Analyst: _____ Supervisor: Baldwin
Date Received: 8-8-80
Date Reported: 9-9-80

Sample Identification

Station: RMI Run-OFF #3
ID Number: SC, — — — — — — — —,
Address: _____
City: _____ Zip: _____
County: Ashtabula Phone: _____
Collected By: SKOWRONSKI - Buda

Grab Sample Date or Beginning Date of Composite Sample—Use Military Time

Year	Month	Day	Hour	Minute
80	08	07	14	30

Ending Date of Composite Sample—Use Military Time

Year	Month	Day	Hour	Minute	CVT	S/T	TYP

Field Treatment:
☐ Filtered ☒ $CuSO_4 + H_3PO_4$
☒ Iced ☐ H_2SO_4
☐ NaOH ☒ HNO_3
☐ Other (Explain)

Additional Information—Analyst Remarks—Non Routine Analytical Requests

(U)

☐ Sample Code	P115,	☐ Conductivity, Field, U-MHO	P94,	☐ Chlorine Total Resd mg/l	P50060,
☐ pH, Field S.U.	P400,	☐ Flow, Instantaneous CFS	P61,	☐ Water Temperature, Field	P10,
☐ Dissolved Oxygen, Field mg/l	P300,	☐ Hydrogen Sulfide mg/l	P71875,	☐ Sample Purpose	P71999,
☐ Stream Gage	P65,	☐ Chlorine Free Avl, Field mg/l	P50064,	☐	

☐ Regular (or indicate by checking boxes)		☐ Phosphorus Sol, P mg/l	P666,	☐ Lithium Total, Li ug/l	P1132,
☐ Turbidity FTU	P76,	☐ Phosphate Reactive P mg/l	P70507,	☒ Manganese Total, Mn ug/l	P1055, 5000
☐ Color Pt-Co	P80,	☐ Chloride, Cl mg/l	P940,	☒ Mercury Total, Hg ug/l	P71900, 1.1
☒ ~~Conductivity at 25°C U-MHO~~	~~P95,~~	☐ Fluoride Total, F mg/l	P951,	☐ Molybdenum Total, Mo ug/l	P1062,
☒ ~~pH, Lab S.U.~~	~~P403,~~	☐ Cyanide,CN mg/l	P720,	☒ Nickel Total, Ni ug/l	P1067, 300
☐ pH, $CaCO_3$ Stability S.U.	P70311,	☐ Silica, Diss. Si mg/l	P955,	☐ Selenium Total, Se ug/l	P1147,
☐ Alkalinity Total, $CaCO_3$ mg/l	P410,	☐ Calcium Total, Ca mg/l	P916,	☐ Silver Total, Ag ug/l	P1077,
☐ Alkalinity Phth, $CaCO_3$ mg/l	P415,	☐ Magnesium Total, Mg mg/l	P927,	☒ Strontium Total, Sr ug/l	P1082, 8000
☐ Alkalinity $CaCO_3$ Stabl, mg/l	P74023,	☐ Sodium Total, Na mg/l	P929,	☐ Thallium Total, Tl ug/l	P1059,
☐ Acidity Total, $CaCO_3$ mg/l	P70508,	☐ Potassium Total, K mg/l	P937,	☐ Tin Total, Sn ug/l	P1102,
☐ Acidity M.O. $CaCO_3$ mg/l	P436,	☐ Aluminum Total, Al ug/l	P1105,	☐ Titanium Total, Ti ug/l	P1152,
☐ Hardness Total, $CaCO_3$ mg/l	P900,	☐ Antimony Total, Sb ug/l	P1097,	☐ Vanadium Total, V ug/l	P1087,
☐ Residue, Total mg/l	P500,	☐ Arsenic Total, As ug/l	P1002,	☒ Zinc Total, Zn ug/l	P1092, 350
☐ Residue, Total Volatile mg/l	P505,	☐ Barium Total, Ba ug/l	P1007,	☐ Carbon Total, Organic C mg/l	P680,
☐ Residue, Total Nfilt (Sus) mg/l	P530,	☐ Berylium Total, Be ug/l	P1012,	☐ Carbon Diss, Organic C mg/l	P681,
☐ Residue, Vol, Nfilt mg/l	P535,	☐ Bismuth Total, Bi ug/l	P1017,	☒ Phenol ug/l	P32730, 10
☒ ~~Residue, Total Filt (Diss) mg/l~~	~~P70300,~~	☐ Boron Total, B ug/l	P1022,	☐ MBAS mg/l	P38260,
☐ Residue, Vol Filt mg/l	P520,	☒ Cadmium Total, Cd ug/l	P1027, 300	☐ Oil-Grease, Total mg/l	P556,
☐ Residue, Settlable ml/l	P545,	☒ Chromium Total, Cr ug/l	P1034, 50	☐ BOD, 5-Day mg/l	P310,
☐ Sulfate, SO_4 mg/l	P945,	☐ Chromium Hex, Cr ug/l	P1032,	☐ COD mg/l	P335,
☐ Nitrogen TKN, N mg/l	P625,	☐ Cobalt Total, Co ug/l	P1037,	☐ TOD mg/l	P343,
☐ Nitrogen Ammonia, N mg/l	P610,	☒ Copper Total, Cu ug/l	P1042, 70	☐	
☐ Nitrate-Nitrite, N mg/l	P620,	☒ Iron Total, Fe ug/l	P1045, 11800	☐	
☐ Nitrite, N mg/l	P615,	☐ Iron Diss., Fe ug/l	P1046,	☐	
☐ Phosphorus Total, P mg/l	P665,	☒ Lead Total, Pb ug/l	P1051, 65	☐	

Distribution: 1—Data Processing 2—Central Office 3—District Office 4—Owner 5—Laboratory

Ohio Department of Health

Sanitary Chemistry Section

Environmental Sample Submission Report

Agency: OEPA
Division Program: WW20
Analysis Reported To: ☐ CO ☐ CDO ☐ SE ☒ NE ☐ SW ☐ NW

Laboratory: ☐ Central ☐ SE ☐ NE ☐ SW ☐ NW
Sample Number: 33294
Analyst: _____ Supervisor: Sedam
Date Received: 8-8-80
Date Reported: 9-9-80

Sample Identification

Station: RMI 001
ID Number: SC, _ _ _ _ _ _ _ _ _ _,
Address: _____
City: _____ Zip: _____
County: Ashtabula Phone: _____
Collected By: SKOWRONSKI - Buda

Grab Sample Date or Beginning Date of Composite Sample—Use Military Time

Year	Month	Day	Hour	Minute
8 0	0 8	0 7	1 5	0 0

Ending Date of Composite Sample—Use Military Time

Year	Month	Day	Hour	Minute	CVT	S/T	TYP

Field Treatment:
☐ Filtered ☐ $CuSO_4 + H_3PO_4$
☒ Iced ☐ H_2SO_4
☐ NaOH ☒ HNO_3
☐ Other (Explain)

Additional Information—Analyst Remarks—Non Routine Analytical Requests

☐ Sample Code	P115,	☐ Conductivity, Field, U-MHO	P94,	☐ Chlorine Total Resd mg/l	P50060,
☐ pH, Field S.U.	P400,	☐ Flow, Instantaneous CFS	P61,	☐ Water Temperature, Field	P10,
☐ Dissolved Oxygen, Field mg/l	P300,	☐ Hydrogen Sulfide mg/l	P71875,	☐ Sample Purpose	P71999,
☐ Stream Gage	P65,	☐ Chlorine Free Avl, Field mg/l	P50064,	☐	

☐ Regular (or indicate by checking boxes)		☐ Phosphorus Sol, P mg/l	P666,	☐ Lithium Total, Li ug/l	P1132,
☐ Turbidity FTU	P76,	☐ Phosphate Reactive P mg/l	P70507,	☐ Manganese Total, Mn ug/l	P1055,
☐ Color Pt-Co	P80,	☐ Chloride, Cl mg/l	P940,	☒ Mercury Total, Hg ug/l	P71900, <0.5
~~☒ Conductivity at 25°C U-MHO~~	~~P95,~~	☐ Fluoride Total, F mg/l	P951,	☐ Molybdenum Total, Mo ug/l	P1062,
~~☒ pH, Lab S.U.~~	~~P403,~~	☐ Cyanide,CN mg/l	P720,	☐ Nickel Total, Ni ug/l	P1067,
☐ pH, $CaCO_3$ Stability S.U.	P70311,	☐ Silica, Diss. Si mg/l	P955,	☐ Selenium Total, Se ug/l	P1147,
☐ Alkalinity Total, $CaCO_3$ mg/l	P410,	☐ Calcium Total, Ca mg/l	P916,	☐ Silver Total, Ag ug/l	P1077,
☐ Alkalinity Phth, $CaCO_3$ mg/l	P415,	☐ Magnesium Total, Mg mg/l	P927,	☐ Strontium Total, Sr ug/l	P1082,
☐ Alkalinity $CaCO_3$ Stabl, mg/l	P74023,	☐ Sodium Total, Na mg/l	P929,	☐ Thallium Total, Tl ug/l	P1059,
☐ Acidity Total, $CaCO_3$ mg/l	P70508,	☐ Potassium Total, K mg/l	P937,	☐ Tin Total, Sn ug/l	P1102,
☐ Acidity M.O. $CaCO_3$ mg/l	P436,	☐ Aluminum Total, Al ug/l	P1105,	☐ Titanium Total, Ti ug/l	P1152,
☐ Hardness Total, $CaCO_3$ mg/l	P900,	☐ Antimony Total, Sb ug/l	P1097,	☐ Vanadium Total, V ug/l	P1087,
☐ Residue, Total mg/l	P500,	☐ Arsenic Total, As ug/l	P1002,	☐ Zinc Total, Zn ug/l	P1092,
☐ Residue, Total Volatile mg/l	P505,	☐ Barium Total, Ba ug/l	P1007,	☐ Carbon Total, Organic C mg/l	P680,
☐ Residue, Total Nfilt (Sus) mg/l	P530,	☐ Berylium Total, Be ug/l	P1012,	☐ Carbon Diss, Organic C mg/l	P681,
☐ Residue, Vol, Nfilt mg/l	P535,	☐ Bismuth Total, Bi ug/l	P1017,	☐ Phenol ug/l	P32730,
~~☒ Residue, Total Filt (Diss) mg/l~~	~~P70300,~~	☐ Boron Total, B ug/l	P1022,	☐ MBAS mg/l	P38260,
☐ Residue, Vol Filt mg/l	P520,	☐ Cadmium Total, Cd ug/l	P1027,	☐ Oil-Grease, Total mg/l	P556,
☐ Residue, Settlable ml/l	P545,	☐ Chromium Total, Cr ug/l	P1034,	☐ BOD, 5-Day mg/l	P310,
☐ Sulfate, SO_4 mg/l	P945,	☐ Chromium Hex, Cr ug/l	P1032,	☐ COD mg/l	P335,
☐ Nitrogen TKN, N mg/l	P625,	☐ Cobalt Total, Co ug/l	P1037,	☐ TOD mg/l	P343,
☐ Nitrogen Ammonia, N mg/l	P610,	☐ Copper Total, Cu ug/l	P1042,	☐	
☐ Nitrate-Nitrite, N mg/l	P620,	☐ Iron Total, Fe ug/l	P1045,	☐	
☐ Nitrite, N mg/l	P615,	☐ Iron Diss., Fe ug/l	P1046,	☐	
☐ Phosphorus Total, P mg/l	P665,	☒ Lead Total, Pb ug/l	P1051, <10	☐	

Distribution: 1—Data Processing 2—Central Office 3—District Office 4—Owner 5—Laboratory

Ohio Department of alth
Sanitary Chemistry Section

Environmenta. ..ample Submission Report

Agency: OEPA
Division Program: WWJC (NE)
Analysis Reported To: ☐ CO ☐ ~~CDO~~ ☐ SE ☒ NE ☐ SW ☐ NW

Laboratory: ☐ Central ☐ SE ☐ NE ☐ SW ☐ NW
Sample Number:
Analyst: Supervisor:
Date Received: 7/ /
Date Reported: 8-28-80

Sample Identification

Station: [illegible]
ID Number: SC, ___ ___ ___ ___ ___ ___ ___,
Address:
City: Zip:
County: [illegible] Phone:
Collected By: [illegible]

Grab Sample Date or Beginning Date of Composite Sample—Use Military Time

Year	Month	Day	Hour	Minute
80	07	29	09	10

Ending Date of Composite Sample—Use Military Time

Year	Month	Day	Hour	Minute	CVT	S/T	TYP

Field Treatment:
- ☐ Filtered
- ☒ Iced
- ☐ NaOH
- ☐ Other (Explain)
- ☒ $CuSO_4 + H_3PO_4$
- ☐ H_2SO_4
- ☒ HNO_3

Additional Information—Analyst Remarks—Non Routine Analytical Requests

☐ Sample Code	P115,	☒ Conductivity, Field, U-MHO	P94, 7[illegible]	☐ Chlorine Total Resd mg/l	P50060,
☐ pH, Field S.U.	P400,	☐ Flow, Instantaneous CFS	P61,	☐ Water Temperature, Field	P10,
☐ Dissolved Oxygen, Field mg/l	P300,	☐ Hydrogen Sulfide mg/l	P71875,	☐ Sample Purpose	P71999,
☐ Stream Gage	P65,	☐ Chlorine Free Avl, Field mg/l	P50064,	☐	

☐ Regular (or indicate by checking boxes)		☐ Phosphorus Sol, P mg/l	P666,	☐ Lithium Total, Li ug/l	P1132,
☐ Turbidity FTU	P76,	☐ Phosphate Reactive P mg/l	P70507,	☒ Manganese Total, Mn ug/l	P1055, [illegible]
☐ Color Pt-Co	P80,	☐ Chloride, Cl mg/l	P940,	☒ Mercury Total, Hg ug/l	P71900, [illegible]
☐ Conductivity at 25°C U-MHO	P95,	☐ Fluoride Total, F mg/l	P951,	☐ Molybdenum Total, Mo ug/l	P1062,
☒ ~~pH, Lab S.U.~~	P403,	☐ Cyanide, CN mg/l	P720,	☒ Nickel Total, Ni ug/l	P1067, [illegible]
☐ pH, $CaCO_3$ Stability S.U.	P70311,	☐ Silica, Diss. Si mg/l	P955,	☐ Selenium Total, Se ug/l	P1147,
☐ Alkalinity Total, $CaCO_3$ mg/l	P410,	☐ Calcium Total, Ca mg/l	P916,	☐ Silver Total, Ag ug/l	P1077,
☐ Alkalinity Phth, $CaCO_3$ mg/l	P415,	☐ Magnesium Total, Mg mg/l	P927,	☐ Strontium Total, Sr ug/l	P1082,
☐ Alkalinity $CaCO_3$ Stabl, mg/l	P74023,	☐ Sodium Total, Na mg/l	P929,	☐ Thallium Total, Tl ug/l	P1059,
☐ Acidity Total, $CaCO_3$ mg/l	P70508,	☐ Potassium Total, K mg/l	P937,	☐ Tin Total, Sn ug/l	P1102,
☐ Acidity M.O. $CaCO_3$ mg/l	P436,	☐ Aluminum Total, Al ug/l	P1105,	☐ Titanium Total, Ti ug/l	P1152,
☐ Hardness Total, $CaCO_3$ mg/l	P900,	☐ Antimony Total, Sb ug/l	P1097,	☐ Vanadium Total, V ug/l	P1087,
☐ Residue, Total mg/l	P500,	☐ Arsenic Total, As ug/l	P1002,	☒ Zinc Total, Zn ug/l	P1092, 210
☐ Residue, Total Volatile mg/l	P505,	☐ Barium Total, Ba ug/l	P1007,	☐ Carbon Total, Organic C mg/l	P680,
☐ Residue, Total Nfilt (Sus) mg/l	P530,	☐ Berylium Total, Be ug/l	P1012,	☐ Carbon Diss, Organic C mg/l	P681,
☐ Residue, Vol, Nfilt mg/l	P535,	☐ Bismuth Total, Bi ug/l	P1017,	☒ Phenol ug/l	P32730, 7
☐ Residue, Total Filt (Diss) mg/l	P70300,	☐ Boron Total, B ug/l	P1022,	☐ MBAS mg/l	P38260,
☐ Residue, Vol Filt mg/l	P520,	☒ Cadmium Total, Cd ug/l	P1027, <5	☐ Oil-Grease, Total mg/l	P556,
☐ Residue, Settlable ml/l	P545,	☒ Chromium Total, Cr ug/l	P1034, 40	☐ BOD, 5-Day mg/l	P310,
☐ Sulfate, SO_4 mg/l	P945,	☐ Chromium Hex, Cr ug/l	P1032,	☐ COD mg/l	P335,
☐ Nitrogen TKN, N mg/l	P625,	☐ Cobalt Total, Co ug/l	P1037,	☐ TOD mg/l	P343,
☐ Nitrogen Ammonia, N mg/l	P610,	☒ Copper Total, Cu ug/l	P1042, 30	☐	
☐ Nitrate-Nitrite, N mg/l	P620,	☒ Iron Total, Fe ug/l	P1045, 10900	☐	
☐ Nitrite, N mg/l	P615,	☐ Iron Diss., Fe ug/l	P1046,	☐	
☐ Phosphorus Total, P mg/l	P665,	☒ Lead Total, Pb ug/l	P1051, 5	☐	

Distribution: 1—Data Processing 2—Central Office 3—District Office 4—Owner 5—Laboratory

Ohio Department of Health

Sanitary Chemistry Section

Environmental Sample Submission Report

Agency: OEPA

Division Program: LOW 20

Analysis Reported To: ☐ CO ☐ CDO ☐ SE ☒ NE ☐ SW ☐ NW

Laboratory: ☐ Central ☐ SE ☐ NE ☐ SW ☐ NW

Sample Number: 2259

Analyst: _____ Supervisor: _____

Date Received: 6/21/00

Date Reported: 7-5-00

Sample Identification

Station: RMI west coal pile

ID Number: SC, — — — — — — —,

Address: Route 7

City: _____ Zip: _____

County: Ashtabula Phone: _____

Collected By: Tuckerman

Grab Sample Date or Beginning Date of Composite Sample—Use Military Time

Year	Month	Day	Hour	Minute
2000	06	21	07	15

Ending Date of Composite Sample—Use Military Time

Year	Month	Day	Hour	Minute	CVT	S/T	TYP

Field Treatment:

☐ Filtered ☐ $CuSO_4 + H_3PO_4$

☐ Iced ☐ H_2SO_4

☐ NaOH ☒ HNO_3

☐ Other (Explain)

Additional Information—Analyst Remarks—Non Routine Analytical Requests

☐ Sample Code	P115,	☐ Conductivity, Field, U-MHO	P94,	☐ Chlorine Total Resd mg/l	P50060,
☐ pH, Field S.U.	P400, 6.3	☐ Flow, Instantaneous CFS	P61,	☐ Water Temperature, Field	P10,
☐ Dissolved Oxygen, Field mg/l	P300,	☐ Hydrogen Sulfide mg/l	P71875,	☐ Sample Purpose	P71999,
☐ Stream Gage	P65,	☐ Chlorine Free Avl, Field mg/l	P50064,	☐	

☐ Regular (or indicate by checking boxes)		☐ Phosphorus Sol, P mg/l	P666,	☐ Lithium Total, Li ug/l	P1132,
☐ Turbidity FTU	P76,	☐ Phosphate Reactive P mg/l	P70507,	☐ Manganese Total, Mn ug/l	P1055,
☐ Color Pt-Co	P80,	☐ Chloride, Cl mg/l	P940,	☒ Mercury Total, Hg ug/l	P71900, 0.5
☐ Conductivity at 25°C U-MHO	P95,	☐ Fluoride Total, F mg/l	P951,	☐ Molybdenum Total, Mo ug/l	P1062,
☐ pH, Lab S.U.	P403,	☐ Cyanide,CN mg/l	P720,	☐ Nickel Total, Ni ug/l	P1067,
☐ pH, $CaCO_3$ Stability S.U.	P70311,	☐ Silica, Diss. Si mg/l	P955,	☐ Selenium Total, Se ug/l	P1147,
☐ Alkalinity Total, $CaCO_3$ mg/l	P410,	☐ Calcium Total, Ca mg/l	P916,	☐ Silver Total, Ag ug/l	P1077,
☐ Alkalinity Phth, $CaCO_3$ mg/l	P415,	☐ Magnesium Total, Mg mg/l	P927,	☐ Strontium Total, Sr ug/l	P1082,
☐ Alkalinity $CaCO_3$ Stabl, mg/l	P74023,	☐ Sodium Total, Na mg/l	P929,	☐ Thallium Total, Tl ug/l	P1059,
☐ Acidity Total, $CaCO_3$ mg/l	P70508,	☐ Potassium Total, K mg/l	P937,	☐ Tin Total, Sn ug/l	P1102,
☐ Acidity M.O. $CaCO_3$ mg/l	P436,	☐ Aluminum Total, Al ug/l	P1105,	☐ Titanium Total, Ti ug/l	P1152,
☐ Hardness Total, $CaCO_3$ mg/l	P900,	☐ Antimony Total, Sb ug/l	P1097,	☐ Vanadium Total, V ug/l	P1087,
☐ Residue, Total mg/l	P500,	☐ Arsenic Total, As ug/l	P1002,	☒ Zinc Total, Zn ug/l	P1092, 125
☐ Residue, Total Volatile mg/l	P505,	☐ Barium Total, Ba ug/l	P1007,	☐ Carbon Total, Organic C mg/l	P680,
☐ Residue, Total Nfilt (Sus) mg/l	P530,	☐ Berylium Total, Be ug/l	P1012,	☐ Carbon Diss, Organic C mg/l	P681,
☐ Residue, Vol, Nfilt mg/l	P535,	☐ Bismuth Total, Bi ug/l	P1017,	☐ Phenol ug/l	P32730,
☐ Residue, Total Filt (Diss) mg/l	P70300,	☐ Boron Total, B ug/l	P1022,	☐ MBAS mg/l	P38260,
☐ Residue, Vol Filt mg/l	P520,	☐ Cadmium Total, Cd ug/l	P1027,	☐ Oil-Grease, Total mg/l	P556,
☐ Residue, Settlable ml/l	P545,	☐ Chromium Total, Cr ug/l	P1034,	☐ BOD, 5-Day mg/l	P310,
☐ Sulfate, SO_4 mg/l	P945,	☐ Chromium Hex, Cr ug/l	P1032,	☐ COD mg/l	P335,
☐ Nitrogen TKN, N mg/l	P625,	☐ Cobalt Total, Co ug/l	P1037,	☐ TOD mg/l	P343,
☐ Nitrogen Ammonia, N mg/l	P610,	☒ Copper Total, Cu ug/l	P1042, 50	☐	
☐ Nitrate-Nitrite, N mg/l	P620,	☐ Iron Total, Fe ug/l	P1045,	☐	
☐ Nitrite, N mg/l	P615,	☐ Iron Diss., Fe ug/l	P1046,	☐	
☐ Phosphorus Total, P mg/l	P665,	☒ Lead Total, Pb ug/l	P1051, 55	☐	

Distribution: 1—Data Processing 2—Central Office 3—District Office 4—Owner 5—Laboratory

Ohio Department of Health

Sanitary Chemistry Section

Environmental Sample Submission Report

Agency: OEPA
Division Program: WW20
Analysis Reported To: ☐ CO ☐ CDO ☐ SE ☒ NE ☐ SW ☐ NW

Laboratory: ☐ Central ☐ SE ☐ NE ☐ SW ☐ NW
Sample Number: 3257
Analyst: _____ Supervisor: Nadeau
Date Received: 6/25/80
Date Reported: 7-18-80

Sample Identification

Station: RMI East coal pile
ID Number: SC, — — — — — —,
Address: Run-off
City: _____ Zip: _____
County: Ashtabula Phone: _____
Collected By: Tuckerman

Grab Sample Date or Beginning Date of Composite Sample—Use Military Time

Year	Month	Day	Hour	Minute
80	06	24	09	07

Ending Date of Composite Sample—Use Military Time

Year	Month	Day	Hour	Minute	CVT	S/T	TYP

Field Treatment:
☐ Filtered ☐ $CuSO_4 + H_3PO_4$
☐ Iced ☐ H_2SO_4
☐ NaOH ☒ HNO_3
☐ Other (Explain)

Additional Information—Analyst Remarks—Non Routine Analytical Requests

☐ Sample Code	P115, 14	☐ Conductivity, Field, U-MHO	P94,	☐ Chlorine Total Resd mg/l	P50060,
☐ pH, Field S.U.	P400, 5.3	☐ Flow, Instantaneous CFS	P61,	☐ Water Temperature, Field	P10,
☐ Dissolved Oxygen, Field mg/l	P300,	☐ Hydrogen Sulfide mg/l	P71875,	☐ Sample Purpose	P71999,
☐ Stream Gage	P65,	☐ Chlorine Free Avl, Field mg/l	P50064,	☐	

☐ Regular (or indicate by checking boxes)		☐ Phosphorus Sol, P mg/l	P666,	☐ Lithium Total, Li ug/l	P1132,
☐ Turbidity FTU	P76,	☐ Phosphate Reactive P mg/l	P70507,	☐ Manganese Total, Mn ug/l	P1055,
☐ Color Pt-Co	P80,	☐ Chloride, Cl mg/l	P940,	☒ Mercury Total, Hg ug/l	P71900,
☐ Conductivity at 25°C U-MHO	P95,	☐ Fluoride Total, F mg/l	P951,	☐ Molybdenum Total, Mo ug/l	P1062,
☐ pH, Lab S.U.	P403,	☐ Cyanide,CN mg/l	P720,	☐ Nickel Total, Ni ug/l	P1067,
☐ pH, $CaCO_3$ Stability S.U.	P70311,	☐ Silica, Diss. Si mg/l	P955,	☐ Selenium Total, Se ug/l	P1147,
☐ Alkalinity Total, $CaCO_3$ mg/l	P410,	☐ Calcium Total, Ca mg/l	P916,	☐ Silver Total, Ag ug/l	P1077,
☐ Alkalinity Phth, $CaCO_3$ mg/l	P415,	☐ Magnesium Total, Mg mg/l	P927,	☐ Strontium Total, Sr ug/l	P1082,
☐ Alkalinity $CaCO_3$ Stabl, mg/l	P74023,	☐ Sodium Total, Na mg/l	P929,	☐ Thallium Total, Tl ug/l	P1059,
☐ Acidity Total, $CaCO_3$ mg/l	P70508,	☐ Potassium Total, K mg/l	P937,	☐ Tin Total, Sn ug/l	P1102,
☐ Acidity M.O. $CaCO_3$ mg/l	P436,	☐ Aluminum Total, Al ug/l	P1105,	☐ Titanium Total, Ti ug/l	P1152,
☐ Hardness Total, $CaCO_3$ mg/l	P900,	☐ Antimony Total, Sb ug/l	P1097,	☐ Vanadium Total, V ug/l	P1087,
☐ Residue, Total mg/l	P500,	☐ Arsenic Total, As ug/l	P1002,	☒ Zinc Total, Zn ug/l	P1092, 130
☐ Residue, Total Volatile mg/l	P505,	☐ Barium Total, Ba ug/l	P1007,	☐ Carbon Total, Organic C mg/l	P680,
☐ Residue, Total Nfilt (Sus) mg/l	P530,	☐ Berylium Total, Be ug/l	P1012,	☐ Carbon Diss, Organic C mg/l	P681,
☐ Residue, Vol, Nfilt mg/l	P535,	☐ Bismuth Total, Bi ug/l	P1017,	☐ Phenol ug/l	P32730,
☐ Residue, Total Filt (Diss) mg/l	P70300,	☐ Boron Total, B ug/l	P1022,	☐ MBAS mg/l	P38260,
☐ Residue, Vol Filt mg/l	P520,	☐ Cadmium Total, Cd ug/l	P1027,	☐ Oil-Grease, Total mg/l	P556,
☐ Residue, Settlable ml/l	P545,	☐ Chromium Total, Cr ug/l	P1034,	☐ BOD, 5-Day mg/l	P310,
☐ Sulfate, SO_4 mg/l	P945,	☐ Chromium Hex, Cr ug/l	P1032,	☐ COD mg/l	P335,
☐ Nitrogen TKN, N mg/l	P625,	☐ Cobalt Total, Co ug/l	P1037,	☐ TOD mg/l	P343,
☐ Nitrogen Ammonia, N mg/l	P610,	☒ Copper Total, Cu ug/l	P1042, 30	☐	
☐ Nitrate-Nitrite, N mg/l	P620,	☐ Iron Total, Fe ug/l	P1045,	☐	
☐ Nitrite, N mg/l	P615,	☐ Iron Diss., Fe ug/l	P1046,	☐	
☐ Phosphorus Total, P mg/l	P665,	☒ Lead Total, Pb ug/l	P1051, 5	☐	

Distribution: 1—Data Processing 2—Central Office 3—District Office 4—Owner 5—Laboratory

5HW-TUB

SEP 27 1982

Ms. Ruth Isham
Registered Agent for
RMI Company
Metals Reduction Plant
30705 Lakeshore Boulevard
Willowick, Ohio 44094

RE: Compliance Order and Consent Agreement

Dear Ms. Isham:

Enclosed please find a Compliance Order which specifies this Agency's determination of certain violations by your company of the Resource Conservation and Recovery Act (RCRA) as amended, 42 U.S.C. 6901 et seq., based on information in our files about your facility at Ashtabula, Ohio (Metals Reduction Plant). The Compliance Order states the reasons for such a determination. In essence, the facility does not have a permit and has not achieved interim status under Section 3005 of RCRA because a timely permit application under Section 3010 of RCRA was not filed with the U.S. Environmental Protection Agency (USEPA). This Compliance Order is issued pursuant to Section 3008 of RCRA (42 U.S.C. 6928).

Accompanying the Compliance Order is a Notice of Opportunity for Hearing. Should you desire to contest the Compliance Order, a written request for a hearing is required to be filed with Regional Hearing Clerk within 30 days from receint of this Compliance Order. A copy of your hearing request should be sent to Gloria Small-Moran. Also enclosed is a Consent Agreement and Final Order. Should you agree to this settlement, please sign it and return it to the person named below.

The proposed settlement in this administrative action will allow you to continue to operate your facility subject to the conditions of the Final Order. The Agency believes that it will be in the public interest to allow your facility to continue to operate subject to the Order's conditions even though your facility has failed to achieve interim status under Section 3005(e) of RCRA. This Order is intended to extend the period of time for submission of the Part A permit application for your facility under 40 CFR 122.22(a)(3) in order to allow the facility to achieve interim status.

In addition, your facility was inspected by representatives of the Ohio Environmental Protection Agency (OEPA) on September 23, 1981. The purpose of this inspection was to determine your facility's compliance status with the RCRA as amended (42 U.S.C. 6901 et seq.). The inspectors identified the following areas of non-compliance: Open burning of hazardous waste in violation of 40 CFR 264.382. The enclosed Compliance Order also addresses the open burning violation.

10

OHIO ENVIRONMENTAL PROTECTION AGENCY   Action Code ____________

GENERATOR ANNUAL HAZARDOUS WASTE REPORT

For the calendar year ending December 31, 19 84

The information requested herein is required by Rules 3745-52-41, 3745-54-75 and 3745-65-75 as applicable of the Ohio Administrative Code.

REFER TO THE SPECIFIC INSTRUCTIONS CONTAINED IN THIS BOOKLET BEFORE COMPLETING THIS FORM.

Please print/type with elite type (12 characters per inch)

I. GENERATOR'S EPA I.D. NUMBER

T/AC

F OHD000810242 1

1 2 13 14 15

II. NAME OF INSTALLATION

RMI COMPANY SODIUM PLANT

30 67

III. INSTALLATION MAILING ADDRESS

3 PO BOX 550

15 16 45

Street or P.O. Box

4 ASHTABULA OH 44004

15 16 41 42 47 51

City or Town   State Zip Code

IV. LOCATION OF INSTALLATION

5 STATE ROAD & E. 6TH STREET   04

15 16 45 47 48

County Code

6 ASHTABULA OH 44004 2819

15 16 41 42 47 51 53 56

City or Town   State Zip Code   Primary SIC Code

V. INSTALLATION CONTACT

2 HOLMAN JOE   216-652-9951

15 16 45 46 55

Name (last and first)   Phone No. (area code & no.)

VI. TRANSPORTATION SERVICES USED

(list the name and EPA identification numbers of all hazardous waste transporters whose services were used during the reporting year.

Mill Service, PAD004835146

Sechan Limestone Industries, PAD002860337

VII. CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

R. J. Gerardy, Vice Pres.-Engineering   RJ Gerardy   3/23/85

Print Type Name   Title   Signature of Authorized Representative   Date Signed

OHIO VIRONMENTAL PROTECTION AGEN Action Code _____

GENERATOR ANNUAL HAZARDOUS WASTE REPORT (cont.)

For the calendar year ending December 31, 19 84

FACILITY INFORMATION
(specify facility to which all wastes on the page were sent)

VIII. GENERATOR'S EPA I.D. NO.

T/AC

G O H D 0 0 0 8 1 0 2 4 2 2

1 2 13 14 15

IX. FACILITY'S EPA I.D. NO.

P A D 0 0 4 8 3 5 1 4 6

26 27

X. FACILITY NAME

M I L L S E R V I C E

28 59

XI. FACILITY'S ADDRESS

R. D. #1

28

Street or P.O. Box

Y U K O N P A 1 5 6 9 8

28

City or Town State/Zip Code

XII. WASTE IDENTIFICATION

Line	A. DESCRIPTION OF WASTE	B. DOT HAZARD CLASS	C. USEPA HAZARDOUS WASTE NUMBER (see instructions)	D. AMOUNT OF WASTE	UNIT OF MEASURE
1	CELL BATH WASTE E.P.TOXIC CONTAINING BARIUM	1 2	D 0 0 5	8 1 5 2 2 0	P
2					
3					
4					
5					
6					
7					
8					

28 29 30 — 33 34 — 37 38 — 41 42 — 45 46 54 55

XIII. COMMENTS (enter information by section number)

OHIO /IRONMENTAL PROTECTION AGEN. Action Code _____

GENERATOR ANNUAL HAZARDOUS WASTE REPORT (cont.)

For the calendar year ending December 31, 19 84

FACILITY INFORMATION
(specify facility to which all wastes on the page were sent)

VIII. GENERATOR'S EPA I.D. NO.

T/AC

G O H D 0 0 0 8 1 0 2 4 2 2

1 2 13 14 15

IX. FACILITY'S EPA I.D. NO.

D A D 0 0 2 8 6 0 3 7 7

16 27

X. FACILITY NAME

S E C H A N L I M E S T O N E I N D U S T R I E S I N C.

28 59

XI. FACILITY'S ADDRESS

R I . D I . # 1

28

Street or P.O. Box

P O R T E R S V I L L E P A 1 6 0 5 1

28

City or Town State/Zip Code

XII. WASTE IDENTIFICATION

Line	A. DESCRIPTION OF WASTE	B. DOT HAZARD CLASS	C. USEPA HAZARDOUS WASTE NUMBER (see instructions)	D. AMOUNT OF WASTE	E. UNIT OF MEASURE
1	CELL BATH WASTE CONTAINING BARIUM E.P. TOXIC	1 2	D005	2263380	P
2					
3					
4					
5					
6					
7					
8					
		28 29	30 — 33 / 34 — 37 / 38 — 41 / 42 — 45	46 — 54	55

XIII. COMMENTS (enter information by section number)

OHIO VIRONMENTAL PROTECTION AGEN Action Code _____

GENERATOR ANNUAL HAZARDOUS WASTE REPORT (cont.)

For the calendar year ending December 31, 19 84

FACILITY INFORMATION
(specify facility to which all wastes on the page were sent)

VIII. GENERATOR'S EPA I.D. NO.

T/AC

G O H D 0 0 0 8 1 0 2 4 2 2

1 2 13 14 15

IX. FACILITY'S EPA I.D. NO.

16 27

X. FACILITY NAME

28 59

XI. FACILITY'S ADDRESS

ON SITE

28

Street or P.O. Box

28

City or Town State/Zip Code

XII. WASTE IDENTIFICATION

Line	A. DESCRIPTION OF WASTE	B. DOT HAZARD CLASS	C. USEPA HAZARDOUS WASTE NUMBER (see instructions)	D. AMOUNT OF WASTE	E. UNIT OF MEASURE
1	SULFURIC ACID CORROSIVE	02	D002	479710	P
2	SODIUM/CALCIUM SLUDGE REACTIVE	08	D003	22177	P
3					
4					
5					
6					
7					
8					
		28 29	30 — 33 / 34 — 37 / 38 — 41 / 42 — 45	46 — 54	55

XIII. COMMENTS (enter information by section number)

XII., Line 1 - 12,000 pounds of waste sulfuric acid was sold to Zinkan Enterprises.

XII., Line 1 - Sulfuric acid treated by elementary neutralization.

OHIC VIRONMENTAL PROTECTION AGE Action Code _____

FACILITY ANNUAL HAZARDOUS WASTE REPORT

For the calendar year ending December 31, 19 84

The information requested herein is required by Rules 3745-52-41, 3745-54-75 and 3745-65-75 as applicable of the Ohio Administrative Code

REFER TO THE SPECIFIC INSTRUCTIONS CONTAINED IN THIS BOOKLET BEFORE COMPLETING THIS FORM.

Please print/type with elite type (12 characters per inch)

I. FACILITY'S EPA I.D. NUMBER

T/AC

F O H D 0 0 0 8 1 0 2 4 2 1 1

(1 2 13 14 15)

II. NAME OF FACILITY

R M I C O M P A N Y S O D I U M P L A N T

(30 67)

III. FACILITY MAILING ADDRESS

3 P O B O X 5 5 0

(15 16 45)

Street or P.O. Box

4 A S H T A B U L A O H 4 4 0 0 4

(15 16 41 42 47 51)

City or Town State Zip Code

IV. LOCATION OF FACILITY

5 S T A T E R O A D & E. 6 T H S T R E E T 0 4

(15 16 45 47 48)

County Code

6 A S H T A B U L A O H 4 4 0 0 4 2 8 1 1 9

(15 16 41 42 47 51 53 56)

City or Town State Zip Code Primary SIC Code

V. FACILITY CONTACT

2 H O L M A N J O E 2 1 6 - 6 5 2 - 9 9 5 1

(15 16 45 46 55)

Name (last and first) Phone No. (area code & no.)

VI. COST ESTIMATES FOR FACILITY

A. Cost Estimate for Facility Closure

$ 2 6 5 7 0 0 0

(16 18 19 21 22 24)

B. Cost Estimate for Post Closure Monitoring and Maintenance (disposal facilities only)

$

(25 27 28 30 31)

VII. CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information in true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

R. J. Gerardy, Vice Pres.-Engineering R J Gerardy 3/28/85

Print/Type Name Title Signature of Authorized Representative Date Signed

OH ENVIRONMENTAL PROTECTION AC CY Action Code _____

FACILITY ANNUAL HAZARDOUS WASTE REPORT (cont.)

For the calendar year ending December 31, 19 84

GENERATOR INFORMATION
(specify generator from which all wastes on this page were received)

VIII. FACILITY'S EPA I.D. NO.

T/AC

G O H D 0 0 0 8 1 0 2 4 2 T 2

(1 2 ... 13 14 15)

IX. GENERATOR'S EPA I.D. NO. (16 ... 27)

X. GENERATOR NAME (28 ... 59)

XI. GENERATOR'S ADDRESS

O N - S I T E (28)

Street or P.O. Box (28)

City or Town

State/Zip Code

XII. WASTE IDENTIFICATION

Line	A. DESCRIPTION OF WASTE	B. HANDLING METHOD (enter code)	C. USEPA HAZARDOUS WASTE NUMBER (see instructions)	D. AMOUNT OF WASTE	I. UNIT OF MEASURE
1	SODIUM/CALCIUM RESIDUE REACTIVE	T 1 8	D 0 0 3	4 4 7 5	P
2	SODIUM/CALCIUM RESIDUE REACTIVE	T 1 8	D 0 0 3	1 7 7 0 2	P
3	CELL BATH WASTE E.P. TOXIC CONTAINING BARIUM	S 0 3	D 0 0 5	3 0 7 8 6 0 0	P
4					
5					
6					
7					
8					

(B: 28 ... 29; C: 30 ... 33, 34 ... 37, 38 ... 41, 42 ... 45; D: 46 ... 54; I: 55)

XIII. COMMENTS (enter information by section number)

T18 metallic sodium converted to oxide form by burning. Closure cost is for treating hazardous waste only.

Return along with your ANNUAL REPORT for 1984 to Ohio EPA, Division of Solid & Hazardous Waste Management

RECYCLING/REDUCTION SURVEY

Generator Name: RMI Company, Sodium Plant EPA ID Number: OHD000810242

Generator Address: P.O. Box 550, Ashtabula, Ohio 44004

Contact Person: Joe T. Holman Phone Number: (216) 652-9951

For the following, please complete these items only for hazardous waste generated in 1984 at your own facility.

A. List the amount/type of characteristic/listed hazardous waste recycled in 1984. Please list by individual waste type. Waste Descriptions, U.S. EPA Hazardous Waste Numbers, and Amount of Waste should match those given on your Annual Report. Complete the last column (On-site/Off-site), only for recycled waste. If you recycled a specific waste both on-site and off-site, list each on a separate line.

If you recycled material that otherwise would have been classified as "D" - code or characteristic hazardous waste, please list this also, even if you did not include this material on your Generator Annual Report because of the reporting exclusion for recycled characteristic waste (OAC 3745-50-06 or 40 CFR 261.6).

	Description of Waste	U.S. EPA Haz. Waste No.	Amount of Waste Generated in 1984	Unit of Measure P(LBS.)/T(TONS) Specify for each entry	Amount of This Waste Recycled in 1984	Recycled On-site or Off-site?
Examples:	*Trichloroethylene*	*F001*	*3,500*	*P*	*3,500*	*On-site*
	Lead Paint Waste	*D008*	*64*	*T*	*32*	*Off-site*
1.	Sulfuric Acid	D002	491,710	P	12,000	off-site
2.						
3.						
4.						
5.						
6.						
7.						
8.						

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region V

RMI CORPORATION an Ohio corporation doing business at 46 State Road, Ashtabula, Ohio	))))	REQUEST PURSUANT TO SECTION 308(a) OF THE FEDERAL WATER POLLUTION CONTROL ACT AS AMENDED, (FWPCA), 33 U.S.C. 1318(a) AND SECTION 114 OF THE CLEAN AIR ACT, AS AMENDED, 42 U.S.C. 1857(c)-9

I

All requests for information contained in this letter pertain only to the manufacturing facility named above which is located in Ashtabula, Ohio, at the address indicated.

For the purpose of this letter, "HCB" means the chemical compound which has the formula C_6Cl_6 and which is called hexachlorobenzene.

Also, for the purpose of this letter, the phrase "period of inquiry" means the continuous period of time beginning on January 1, 1972, and ending on the day this letter is received by your company.

II

Within ten (10) days following the day on which this letter is received, your company must provide the information described in this section.

1. The results of any and all tests performed by or for your company during the period of inquiry which indicate the presence or absence of HCB in the air, water, sediment, soil, or other medium on your company's premises or in the solid waste, wastewater discharge, or emissions to the air from your company.

INTEROFFICE COMMUNICATION

TO Rich Shank, DHMM, Central Office DATE May 6, 1983

FROM: Melinda Merryfield-Becker, DHMM, Northeast District Office
and Gary Gifford, DHMM, Northeast District Office

SUBJECT: Alchemtron - Addendum to Report

Becker talked with Joe Holman of RMI on May 3, 1983. He said that there is a possibility of hydrogen gas evolution when titanium is in the lower oxidation state. Titanium has a +3 and +4 oxidation state. It is expected to be in the higher oxidation state in the presence of nitric acid. This shipment was unusual because it had no nitric acid.

See the following equations:

1. $2TiF_3 + 3CA(OH)_2 \rightarrow 2TiO_2 + 3CaF_2 + H_2\uparrow + 2H_2O$

2. $TiF_4 + 2Ca(OH)_2 \rightarrow TiO_2 + 2CaF_2 + 2H_2O$

Attached is a copy of RMI's analytical data.

MMB:km

Attachment

cc: Roger Hannahs, DHMM, Central Office
Connie Rogers, DHMM, Central Office

Post-Sodium 8-22-83 Joe Holman
S. Johnson
C. Grazis
Hanek

Consent Agreement - March deadline
possible proposal - reclaim more waste in furnace
+ react w/ superheated steam → caustic
(Babcox & Wilcox process pending)

× Contingency Plan changes
1. adding phone & address

Operating record
dates, personnel, quantity, code, common name, location

Burn room operation - 2-3 day/wk. frequency

Burn pad frequency - ~1 day/mo (<12 times/yr)
600' from EHI bldg, 50-60' to CEI property

Inspection
- barium waste ✓

Manifests - all info present & rec'd w/i 30 days

Personnel training -
dates) - Sept 5 the wk - salary personnel
dates) - Sept 19 the wk - hourly personnel

RMI - SODIUM 5-4-84

B. BOWMAN
J. HOLMAN
B. DIGIENZO

OPEN BURNING - WILL CONSTRUCT NEW BURNING ROOM - EXPECT TO FINISH BY NOVEMBER, '84 (OLD BURNING ROOM WILL BE ELIMINATED)

DISPOSERS - MILL SERVICES & SECHAN (PRIMARY)

CONTINGENCY PLAN WILL CHANGE WITH NEW BURN ROOM
WILL REVISE E.C. & OTHER NAMES, REMOVE SHED W/ EQUIP.

CLOSURE COST - CHECK ON UPDATE

FINANCIAL ASSURANCES - CHECK WITH DEB T.

DANGER SIGN NOT POSTED DUE TO LIMITED ACCESS BY PERSONNEL AND NATURE OF WASTE (BARIUM CONTAINING)

NO OPEN BURNING OCCURRING DURING INSPECTION

CLOSURE WILL HAVE TO BE INITIATED ON THE OPEN BURNING PAD & OLD BURN ROOM.

OPERATING RECORD - ADD EPA WASTE CODE & PHASE

BA. Pile Positions - prevent runoff from existing PAD

MODIFICATIONS TO SOUTH CHUTE

The present waste cell bath containment and holding area (the south chute) is a three-sided, open ended concrete structure. The side walls are of stepped variable height from six feet to four feet high. The entire area is covered by a shed roof. The present open end of the containment allows access for placement and removal of waste.

The proposed modifications to upgrade the present structure to meet current state and federal regulations are as follows:

1. Extend each side of the containment structure ten feet.

2. Enclose the open end of the structure.

3. The extension (sides and end) will be a six inch concrete curb having a three foot deep footing.

4. The south end of the extension will have a ramp installed over the curb to allow access.

5. The shed roof will be extended to cover the new addition.

6. The entire containment area will be lined with steel plate, with side plates welded to the base plate.

WASTE PILE STORAGE AT THE SOUTH CHUTE

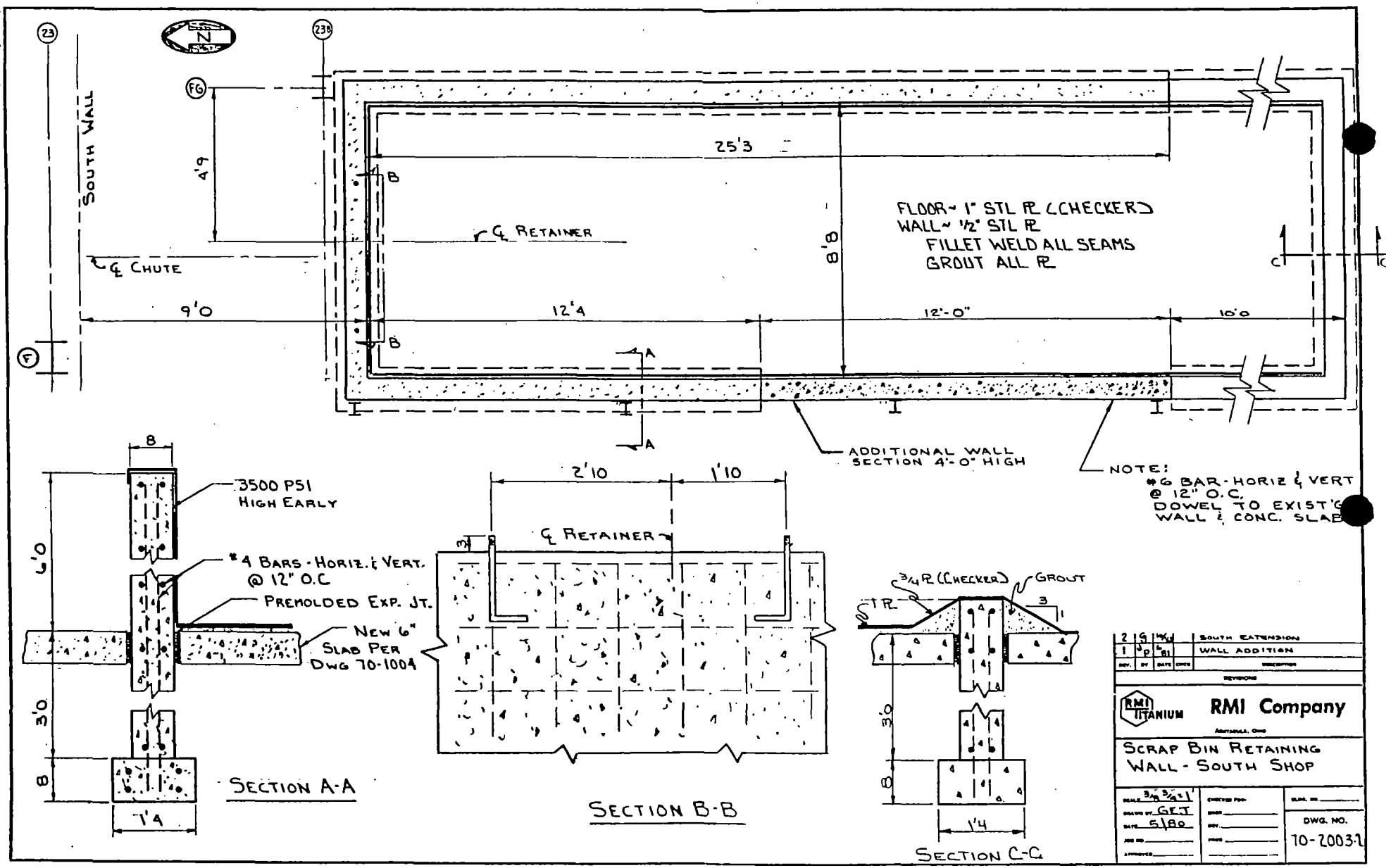
As an alternative to removing the waste daily from the south chute and placing it in a 20 yard roll-off container, the waste may accumulate in the south chute until sufficient material (≈20 cu. yd.) is generated, at which time the material is shipped off-site for disposal.

Under such circumstances, the south chute becomes a waste pile under RCRA. The south chute is therefore designed to comply with the Ohio Administrative Code 3745-57-30 through 50, and must be operated in compliance with same. These regulations are given in Appendix III.

The waste pile containment is designed to minimize contact with precipitation and eliminate releases due to rainwater coming in contact with the waste. The design of the south chute and the nature of the waste (the calcium chloride absorbs moisture from the air) precludes the waste becoming airborne due to wind. Therefore compliance with the regulations can be maintained if the chute is maintained and waste is not allowed to accumulate in excess of 30 yards. A diagram of the south chute waste pile is given in Appendix IV.

INSPECTIONS OF THE WASTE PILE

Formal inspections of the waste pile will be conducted weekly by the supervisor in charge of the operation or his designee. The inspections will be recorded in the Cell Bath Waste Log. See Inspection of Storage Facility for more detail.



2	G	1/4/81		SOUTH EXTENSION
1	JP	6/81		WALL ADDITION
REV.	BY	DATE	CHKD	DESCRIPTION

REVISIONS

RMI TITANIUM — RMI Company
Ashtabula, Ohio

SCRAP BIN RETAINING WALL - SOUTH SHOP

SCALE 3/8" = 1'	CHECKED BY	SUB. NO.
DRAWN BY GRJ	ISSUED	DWG. NO.
DATE 5/80	APPV.	70-2003-1
JOB NO.	PROJ.	
APPROVED		

July 26, 1973

Mr. John Kelley
Chief, Technical Review Team
Permit Branch - Region V
U.S. Environmental Protection Agency
1 North Wacker Drive
Chicago, Illinois 60606

Subject: RMI Company -- Sodium and Chlorine Plant
Ashtabula, Ohio -- Application No. OX2-000158

Dear Mr. Kelley:

This letter is to confirm the basic understandings reached in the meeting which was held with you and your associates on July 6, 1973. The information which the U.S. Environmental Protection Agency is using as a basis of review in considering the subject application was obtained from the forms filed with the Corps of Engineers in 1971. Due to the timing schedule set by the Corps, much of the information which was reported had to be collected over a very short period of time; and any cycle patterns which might occur during a year, or from year-to-year, were not available. In most cases, maximum and minimum requirements had to be estimated. For these reasons, the original data must be updated to more nearly represent the actual conditions.

RMI Company obtains the majority of its process water for the Sodium and Chlorine Plant from Lake Erie and uses it in the raw form. During the past year, Lake Erie has risen to a level never before recorded. The high water and winds have caused heavy bank erosion and lake turbulence. As a result of this condition, the degree of pollution of the raw lake water has a much greater variation than would normally be expected. For example, the average total suspended solids contained in the raw Lake Erie water at the time the Corps of Engineers' forms were filed in 1971 amounted to 27 ppm. The corresponding average value for the recent period of high water in Lake Erie was 43 ppm with maximum values in the 145 ppm range. An increase of 63 percent in the average value and better than 5 to 1 in the average-to-peak relation is impossible to anticipate, and we have no way of knowing that the condition might not get progressively worse in some other similar period of time.

There is also a significantly similar change in the total dissolved solids in the raw Lake Erie waters. Due to these conditions we, again, request consideration be given to the "net effect" of the effluent contamination through RMI Company's Sodium and Chlorine Plant.

The Sodium and Chlorine Plant of RMI Company has a sewer system that not only collects discharged water from the various operating locations but, also, collects rainwater from roof and surface drains. During the periods of inclement weather, this causes the effluent from the Plant to be extremely high in suspended solids, a condition over which we have no control. There is no practical way to separate the storm water from process water; and even if we could, the same contamination would occur in the streams in total. We do not feel that we should be held responsible for the high contamination level which occurs during the periods of heavy rains or from thawing conditions following snowstorms.

The Fields Brook Briefing Memo, which accompanied your letter of June 21, 1973 to me, stated that because of the low flow in the Ashtabula River, no consideration could be given to using the Ashtabula River as a mixing zone. We don't believe full consideration was given to the actual conditions which exist at the point where Fields Brook enters the River. The surface elevation of the water in the Ashtabula River is the same as that of Lake Erie for approximately one-half mile upstream from the entrance of Fields Brook. While there does not seem to be accurate figures as to the depth of the River up to the entrance of Fields Brook, it is navigable during all periods of the year; and since the width of the River averages well over 100 feet wide, there is certainly a very sizable volume of water which exists at the location at all times. It is a known fact that fish are present in the area where Fields Brook enters the Ashtabula River; and as far as is known, there is no evidence to indicate low flow conditions in the Ashtabula River have been detrimental to fish life at or below the entrance of Fields Brook. This would result in the conclusion that either the flow from Fields Brook does not have the detrimental effect on the quality of water in the Ashtabula River as thought, or the quality of the water from Fields Brook is not as detrimental to the overall conditions as has been assumed.

The operation of the Sodium Plant of RMI Company requires the disposal of a relatively small amount of impure chlorine gas. In order to prevent a serious air pollution problem, this gas is neutralized with lime with a resulting contamination of chlorine in the effluent above present desirable levels. To the best of our knowledge, there is no acceptable established technique for removing this volume of chlorine from water without creating a more serious problem than the water contamination. It is further our belief the presence of chlorine in our effluent is the most detrimental contaminant we have, not only to marine life but as a possible public nuisance to the community. RMI Company is actively engaged in developing a method of removing the chlorine

RMI TITANIUM

RMI Company

O. BERTEA
GENERAL MANAGER—ASHTABULA OPERATIONS

ASHTABULA PLANTS
P. O. BOX 550
ASHTABULA, OHIO 44004
216/997-5141

May 22, 1981

Mr. William T. Skowronski, P.E.
Group Chief
Industrial Wastewater Division
Ohio Environmental Protection Agency
Northeast District Office
2110 E. Aurora Road
Twinsburg, Ohio 44087

Dear Mr. Skowronski:

Enclosed you will find a copy of the Herron report - Subject: Subsurface Investigation and Groundwater Monitoring - RMI Company Sodium Plant. This report should answer a number of the questions that you posed in our phone conversation last week. We can address other questions which you may have at our June 3, 1981 meeting.

You indicated that you wanted as much of the information as possible prior to our scheduled get-together.

Very truly yours,

RMI COMPANY

O. Bertea

OB:hm

Encls. - Herron Report

SUBSURFACE INVESTIGATION & GROUNDWATER MONITORING

RMI COMPANY

SODIUM PLANT

ASHTABULA, OHIO

F O R

RMI Company

P. O. Box 550

Ashtabula, Ohio 44004

HCI Project No: M-2178.143K

Report Submittal Date: 4 March 1981

HERRON CONSULTANTS, INC.
ENGINEERING • TESTING • INSPECTION

HERRON CONSULTANTS, INC.
ENGINEERING • TESTING • INSPECTION
5555 CANAL ROAD CLEVELAND, OHIO 44125
447-1335

4 March 1981

RMI Company
P. O. Box 550
Ashtabula, Ohio 44004

SUBJECT: SUBSURFACE INVESTIGATION & GROUNDWATER MONITORING
RMI COMPANY
SODIUM PLANT
ASHTABULA, OHIO

HCI Project No: M-2178.143K

This report summarizes the results of a study conducted at the request of Mr. George Hakkio, Chief Engineer - Ashtabula Plants. The investigated site is Sodium Plant of RMI Company in Ashtabula, Ohio.

The study was authorized per Purchase Order No. 3-68175, dated 7 December 1980. It was intended to determine the following:

(a) stratigraphic sequence of various geophysical formations within certain sectors of Sodium Plant of RMI Company in Ashtabula,

(b) nature and level of chemical contaminants within the investigated area's groundwater, and

(c) direction of groundwater flow and flow gradient.

SITE CONDITIONS

The investigated site measures approximately 700' x 700' in plan dimensions. It is located about 500' east of westerly property limits along State Road and 70' north of south property line. Approximately 100' east of north-east property limits there exist currently coal piles

belonging to Cleveland Electric Illuminating Company. Areas north and northwest of the investigated site are occupied by a system of railroad tracks, and RMI office buildings and manufacturing plant complex respectively. There also exists two ponds - one immediately to the southeast and the other approximately 350' west of the westerly limits of the investigated site. Another pond exists exterior to and in the vicinity of northwest corner of the subject site. An unpaved road, about twenty (20) feet wide, bounds those RMI sectors included under this investigation.

Surface water flowing from the CEI coal piles enters RMI at about mid-point of easterly limits of the investigated site and leaves the subject area at its approximate southwest corner.

A submitted drawing showing general layout and surface topography of RMI Sodium Plant in Ashtabula, Ohio, date of photography 11-16-79, date of mapping, December, 1979, project no. 178, indicates the surface elevations to range between minimums of about 635' along the unpaved peripheral road and maximums of over 645' in the vicinity of southeast investigated site sectors.

Further, during our site meeting with Mr. Hakkio on 25 November, 1980, we were informed that deposition of the miscellaneous fill materials was limited to approximately westerly half and southeast sections of the investigated site.

INVESTIGATION PROGRAM

At the time this study was undertaken in early December, 1980, it was proposed that three (3) monitoring wells should be installed within those site areas where fill materials had been deposited in the past. In connection with each of the monitoring wells, four observation holes were proposed to determine groundwater flow direction and flow gradient. It was also proposed that two additional solo observation holes, one each at where the surface water from CEI site enters and leaves the investigated RMI areas, be installed. At a later date, fourth monitoring well and associated four (4) observations holes were requested by Mr. Hakkio. Only

water samples taken from the four (4) monitoring wells and two (2) solo observation wells were proposed to be subjected to chemical analysis. Approximate locations of the individual monitoring and observation wells are shown on the accompanying Plot Plan which has been taken directly from the referenced document.

Overall field and laboratory program has involved the following:

Soil and Water Sampling Operations, and Laboratory Test Studies

At each of the monitoring and observation well locations, test holes were advanced by rotary drive drilling procedures, employing 7.0 inch o.d. by 3.25 inch i.d. hollow stem continuous flight augers.

Variations of soil and groundwater conditions encountered during the boring operations were noted only at the monitoring well locations. This was accomplished by taking representative samples of the existing subsoil at intervals by means of a two-inch o.d. split spoon sampling device, driven by a 140 pound hammer, free falling through a distance of thirty (30) inches. During the course of sampling operations, the number of hammer blows required to achieve eighteen (18) inches of sample spoon penetration, including an initial six-inch penetration, was noted and is recorded in six-inch increments under "Blow Counts" on the accompanying Test Boring Logs. The sum of the blow counts associated with the second and third six-inch penetration intervals is customarily termed "standard penetration resistance" (N).

The samples of materials obtained as a result of drive sampling operations were removed from the sampler, visually classified and placed in properly identified sealed glass sample jars. The subsoil material samples were then removed to our Cleveland soil mechanics laboratory for evalaution.

In addition to the soil samples, one (1) water sample from each of the monitoring wells and observations wells P-1 and P-2 were procured subsequent to their installation, details of which are given in the next section. The samples were brought to our Cleveland Chemistry laboratory for chemical analysis. The soil and water samples, were subjected to the following laboratory tests:

(a) The subsoil materials were reclassified in substantial accordance with the requirements of the American Society for Testing and Materials' method designation D 2488, "Description of Soils (Visual-Manual Procedures)" and identified employing the nomenclature of the Unified Soil Classification System (ASTM D 2487).

The results of visual-manual classification operations, together with certain pertinent data developed during field exploration operations, are included on the accompanying Test Boring Logs.

(b) Water samples were subjected to chemical analysis for determination of the following:

Arsenic
Barium
Cadmium
Chromium
Lead
Mercury
Selenium
Silver
Xylene Water
Volatile at 105°F
Volatile at 540°F
Chemical Oxygen Demand
pH
Conductivity

Installation of Monitoring and Observation Wells

Each observation well primarily consisted of about fifteen (15) feet long, two-inch diameter perforated PVC pipe. The pipe was installed immediately following drilling the hole with 7.0-inch o.d. hollow stem continuous flight auger.

Monitoring well consisted of about twenty-five (25) foot long 6-inch diameter flush joint schedule 80 PVC casing with five (5) foot long no. 60 slot PVC well screen at the bottom.. Because of the difficulty in keeping the test holes open subsequent to removal of 7.0 inch o.d. flight augers, at each monitoring well location holes were redrilled with 12-inch o.d. solid stem auger immediately prior to well installation. Sand was poured in the annular space between the PVC pipe and the surrounding soil for full depth minus between about two (2) and three (3) feet. Each well was then completed by filling the remaining annular space with bentonite balls. Each well extended by between about two (2) and four (4) feet above the surrounding site grade. Each monitoring well casing was protected by an 8-inch diameter and about five (5) foot long protective iron pipe with lockable cover.

Typical details of the monitoring and observations are shown in Plates 1 and 2 respectively.

RESULTS

(a) Subsurface Profile

Results of the field drilling operations indicate the site areas to be overlain by fill materials consisting of sand, clay, brick, and/or concrete, and/or cinder and occasional chemical odor. Following thicknesses of the fill materials were indicated at the monitoring well locations from where soil samples were taken:

Test Position	Fill Thickness, ft.
M-1	5.0±
M-2	9.5±
M-3	9.0±
M-4	-

Inferior to surface grades and/or the fill materials, area's predominant subsurface formation consists of brown and/or gray silty clay with occasional lenses/layers of sand and silt. Cohesive materials exhibit medium to hard structural states and moist to wet consistencies. At positions M-1 and M-3, silty clay was found to be intersticed with medium to dense and wet layers of gray silt. Silt layers ranged in thickness of between about 1.5 and three (3) feet, and were encountered at varying depths. Subsurface materials at M-1 and M-2 exhibited strong chemical odor through full depth of field exploratory operations.

During the course of field exploratory operations, the following water depths were indicated.

Test Location	Water Depth, ft. Encounter	Completion
M-1	4.0	-
	21.5	
M-2	12.0	-
	27.0	
M-3	16.0	-
M-4	27.0	26.0
	23.0 (Seepage)	12.4 (4-hours)

(b) Chemical Evaluation

Results of the laboratory chemical analysis and the maximum concentrations recommended by U.S. Environmental Protection Agency (Reference: FEDERAL REGISTER, Vol. 45, No. 98, May 19, 1980, Rules and Regulations), wherever applicable, are given in the accompanying Table No. 1. Report by Crobaugh Division of Herron Testing Laboratories, Inc. where the chemical tests were performed, is also included in the Appendix to this submittal.

The table shows that at the subject site, the level of heavy metal contaminants is far below the upper limits recommended by U.S., EPA.

(c) Groundwater Monitoring

The following two (2) methods have been employed to determine direction of the groundwater flow and the flow gradient.

Graphical

This involves establishment/determination of

(i) location of the individual monitoring and observation wells,

(ii) elevation of the ground at the monitoring and observation well locations, and

(iii) groundwater table elevations

Summary of the ground and the groundwater elevations is included in the accompanying Table No. 2.

Using the data of Table No. 2, direction of groundwater flow and the flow gradient were determined for three different cases. The method utilizes one upgradient and two down gradient water wells, and is illustrated in Plates #3, #4 and #5. The three cases investigated resulted in the following groundwater flow directions and flow gradients.

Plate Number	Groundwater Flow Direction	Flow Gradient
3	Towards S 32.5° W	0.026
4	Towards N 17° W	0.0133
5	Towards S 17° W	0.0117

NOTE: "North" has been assumed to be parallel to State Road.

It must be recognized that groundwater flow direction is significantly influenced by the local topography of the area. It is evident from the results, tabulated above, that groundwater has the tendency to flow generally towards the existing creek which crosses the investigated site immediately west of M-4 in the north-south direction, south of M-2 and north of M-1 in the east-west direction, and leaves the site in the vicinity of P-2. The influence of local surface topography and drainage pattern on the preferential direction of groundwater flow is exemplified in Plates #3, #4 and #5. For instance, in Plate #4 which involves wells M-1, M-2 and P-2, located on either side of east-west section of the creek and in the vicinity of southerly property limits, flow is indicated towards northwest direction; while in Plate #3 representing wells M-1, M-2, M-3 located on either of north-south section of creek, groundwater flow was found to be towards south-west direction. Such variations in the flow direction can and will occur where sudden alterations in either the surface topography and/or the drainage pattern are either introduced or exist.

Dye Injection

To supplement the information gathered from graphical representation relative to groundwater flow direction, dye was introduced in monitoring wells M-1, M-2 and M-3 on 11 March, 1981. The intention being that appearance of this dye in any of the surrounding observation wells will reflect the general directions of groundwater flow. Field visit was made on 17 March 1981 to observe if in fact dye had traversed to any of the observation wells. No dye was detected. This in our opinion is due to very low permeability of the area's silty clay soils. With the known permeabilities of silty clay formation to range between 10^{-5} and 10^{-7} cm/sec., it could take extended time period before dye will be seen in any of the observation wells surrounding a particular monitoring well unless of course, the water is forced to flow under pressure. This process will require extensive preparation and time involvement in the field.

We thank you for the opportunity to work on this project and look forward to working with you in the future. In the meantime, if you have any questions, please do not hesitate to contact us.

HERRON CONSULTANTS, INC.

Vijay K. Khosla, Ph.D., P. E.
Director of Engineering

VKK/lk

3cc: The RMI Company

TABLE 1

SUMMARY OF LABORATORY CHEMICAL ANALYSIS

Factor		Laboratory Test Data M-1	M-2	M-3	M-4	P-1	P-2	U.S. EPA Recommended Maximum Concentration
Arsenic,	ppm	0.056	0.017	0.001	0.027	0.003	0.005	5.0
Barium,	ppm	5.0	0.18	0.24	0.09	0.5	0.92	100.0
Cadmium,	ppm	0.44	<0.02	<0.02	<0.02	<0.02	<0.02	1.0
Chromium,	ppm	0.08	0.01	<0.01	<0.01	<0.10	0.05	5.0
Lead,	ppm	<0.20	0.04	<0.02	<0.02	<0.20	<0.08	5.2
Mercury,	ppm	0.0002	0.0002	<0.0001	0.0007	<0.0001	0.0001	0.2
Selenium,	ppm	0.001	0.004	<0.001	<0.001	<0.001	<0.001	1.0
Silver,	ppm	0.017	0.09	<0.02	<0.02	0.03	0.03	5.0
Xylane Water,		91	90	95	90	95	95	-
Volatile at 105°F, %		98.9	99.6	99.7	99.9	98.6	93	-
Volatile at 540°F, %		92.4	72.0	84.2	90.4	69.6	79.6	-
Chemical Oxygen Demand		604	208	306	68	420	127	-
pH		5.9	7.6	7.1	7.6	7.2	7.1	-
Conductivity Mohs/Cm. at 25°C		79002	6105	4429	1388	15800	12808	-

HENDRON CONSULTANTS, INC.
ENGINEERING · TESTING · INSPECTION

TABLE 2

SUMMARY OF STATION AND GROUNDWATER ELEVATIONS

Station Number	Station Elevation, MSL Ground	Pipe	Water Elevation MSL 1-31-1981	2-26-1981	3-11-1981*
M-1	636.60	639.17	633.60	634.3	633.6
E01	636.80	638.93			
W01	636.70	640.46			
N01	637.50	641.72			
S01	636.20	638.65			
M-2	637.20	639.35	631.20	631.1	630.6
E02	638.10	640.36			
W02	636.40	638.91			
N02	637.50	641.19			
S02	636.80	639.28			
M-3	641.20	643.03	636.20	636.9	637.1
E03	641.00	643.35			
W03	640.00	642.59			
N03	640.60	642.67			
S03	641.00	642.89			
M-4	637.80	641.56	636.30	636.4	635.7
E04	637.00	639.46			
W04	638.00	640.29			
N04	637.50	639.67			
S04	637.10	639.37			
P-1	634.50	636.21	632.5	632.9	632.5
P-2	632.70	636.19	629.2	630.4	631.7

(*) Represents stable groundwater condition since no significant rainfall occurred between 2-26-1981 and 3-11-1981.

HERRON TESTING LABORATORIES, INC.
CROBAUGH DIVISION
INORGANIC AND ORGANIC ANALYSIS
5405 E. SCHAAF RD.
CLEVELAND, OH 44131
(216) 524-1450

Purchase Order No. M 2178
File No. C 4555
February 27, 1981

Analysis of Six (6) Water Samples
Marked Please see below

Client The R.M.I. Company
P.O. Box 550
Ashtabula, Ohio 44004
Received on 2-3-81

CHEMICAL ANALYSIS

Customer I.D.	P1	P2	M1	M2	M3	M4
HTL I.D.	C 4555-1	C 4555-2	C 4555-3	C 4555-4	C 4555-5	C 4555-6
HCI I.D.	1	2	3	4	5	6
Arsenic	0.003	0.005	0.056	0.017	0.001	0.027
Barium	0.50	0.92	5.0	0.18	0.24	0.09
Cadmium	<0.02	<0.02	0.44	<0.02	<0.02	<0.02
Chromium	<0.10	0.05	0.08	0.01	<0.01	<0.01
Lead	<0.20	<0.08	<0.20	0.04	<0.02	<0.02
Mercury	<0.0001	0.0001	0.0002	0.0002	<0.0001	0.0007
Selenium	<0.001	<0.001	0.001	0.004	<0.001	<0.001
Silver	0.03	0.03	0.17	0.05	<0.02	<0.02
(Xylene) H_2O	95%	95%	91%	90%	95%	90%
Volatiles 105°C.	98.6%	93.0%	98.9%	99.6%	99.7%	99.9%
Volatiles 540°C.	69.6%	79.6%	92.4%	72.0%	84.2%	90.4%
COD	420	127	604	208	306	68
pH	7.2	7.1	5.9	7.6	7.1	7.6
Conductivity-umhos/cm @ 25°C.	15800	12808	79002	6105	4429	1388

The above results are in mg/l unless otherwise specified.

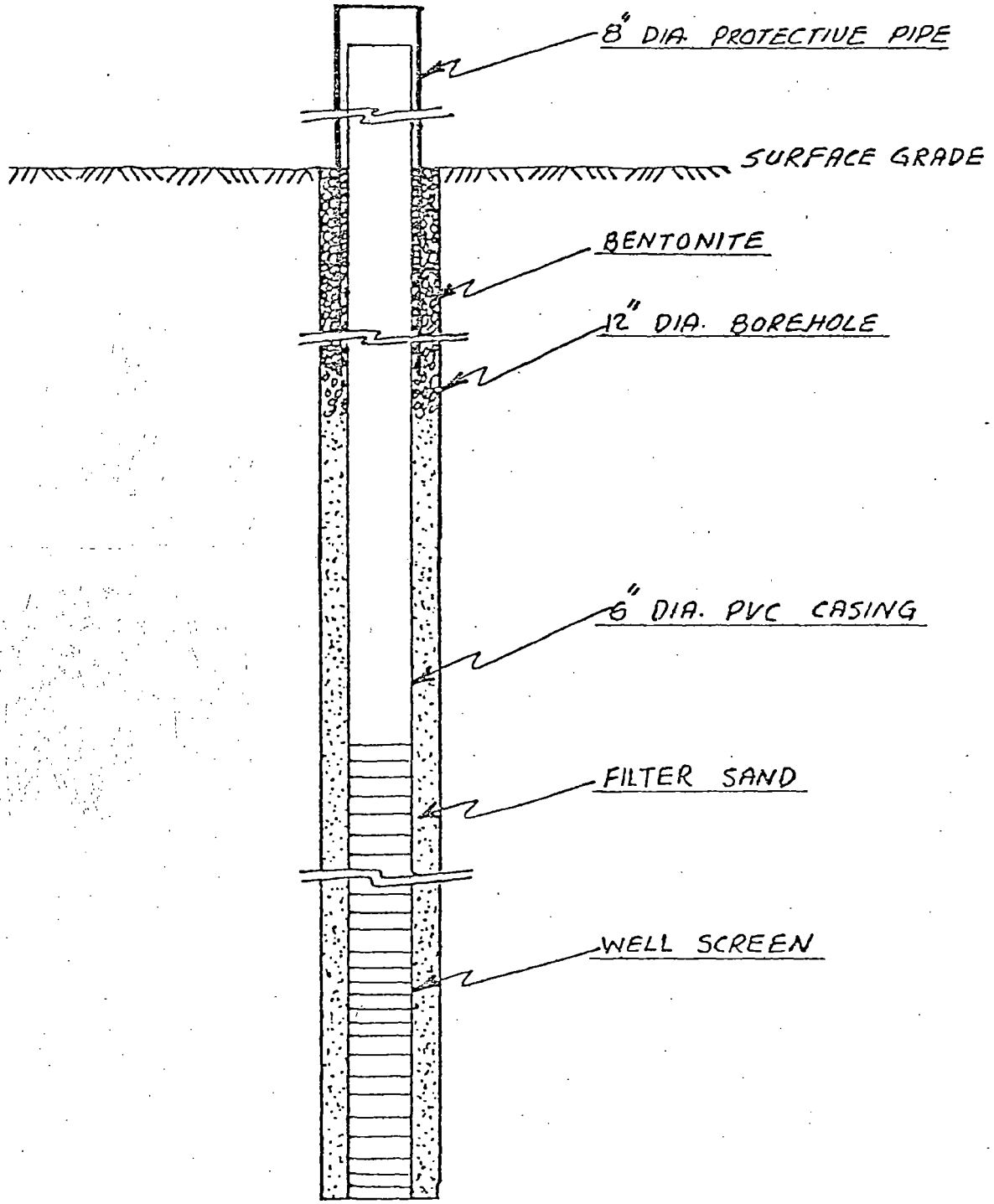
The water content by xylene distillation is an empirical value utilized to give an estmiation of the possibilty of low boiling point volatile organics.

Respectfully submitted,

CROBAUGH DIVISION
HERRON TESTING LABORATORIES, INC.

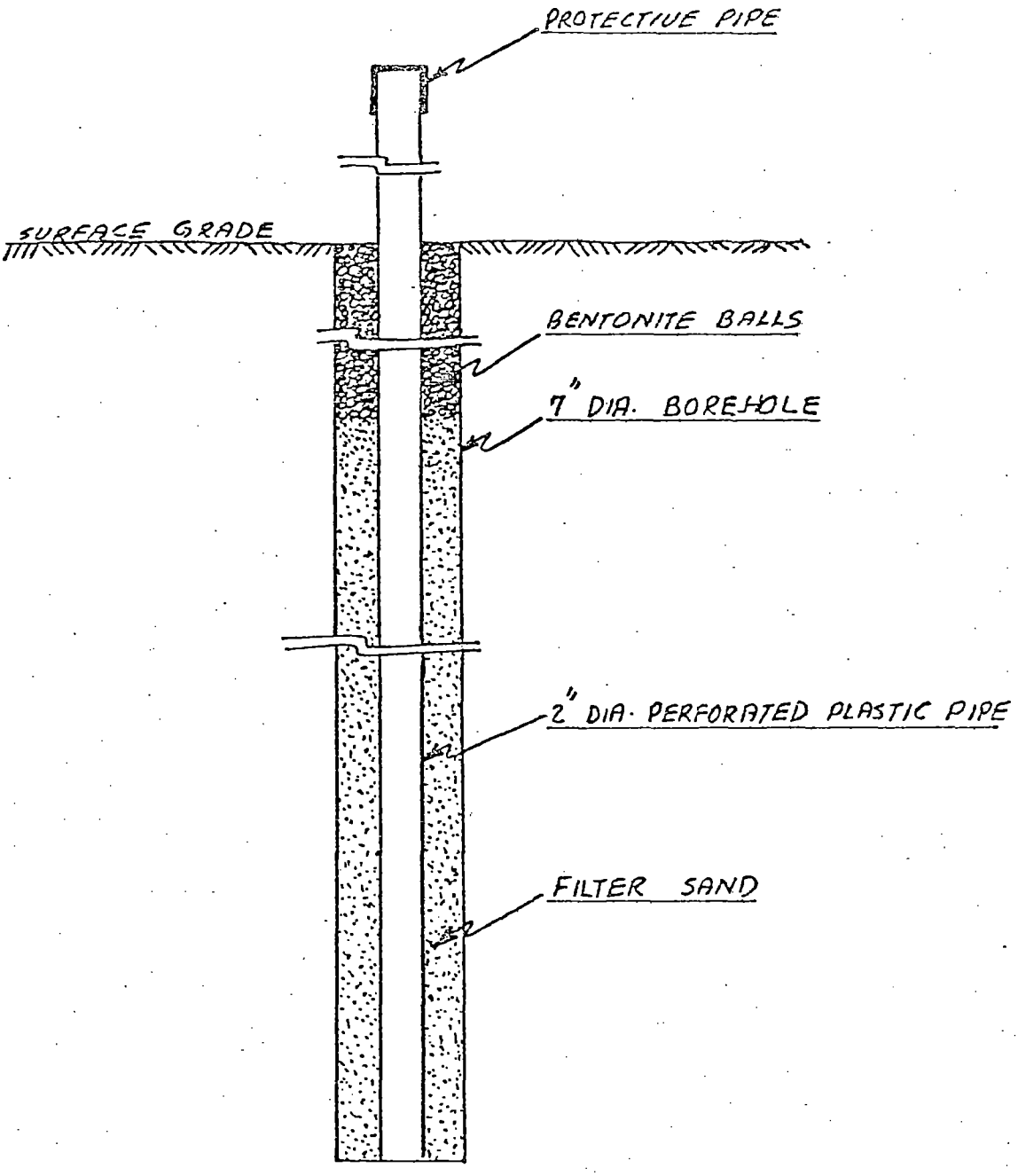
Robert Haddad
Technical Administrator

ljc



SCHEMATIC MONITORING WELL

PLATE NO. 1



SCHEMATIC OBSERVATION WELL

PLATE NO. 2

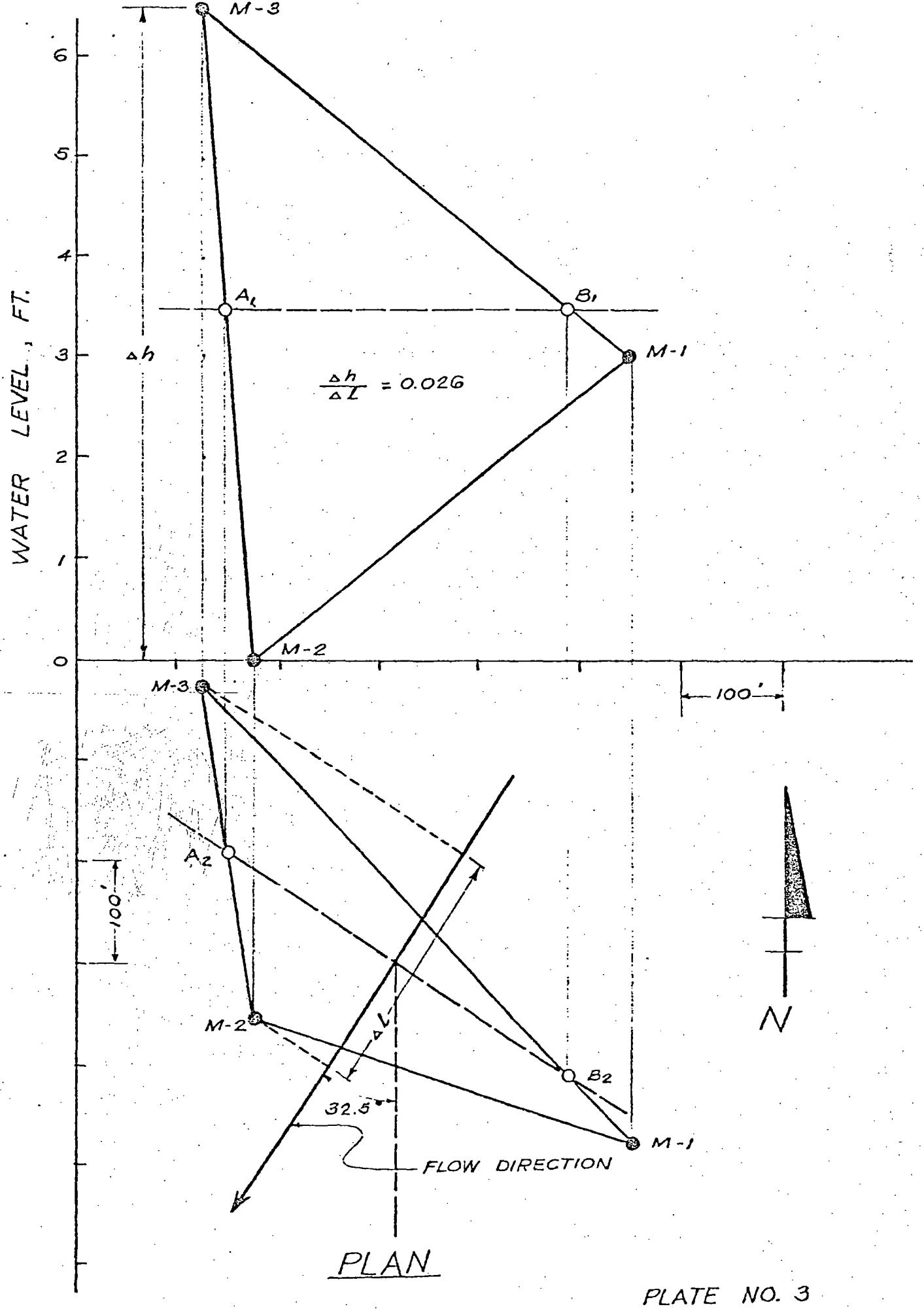
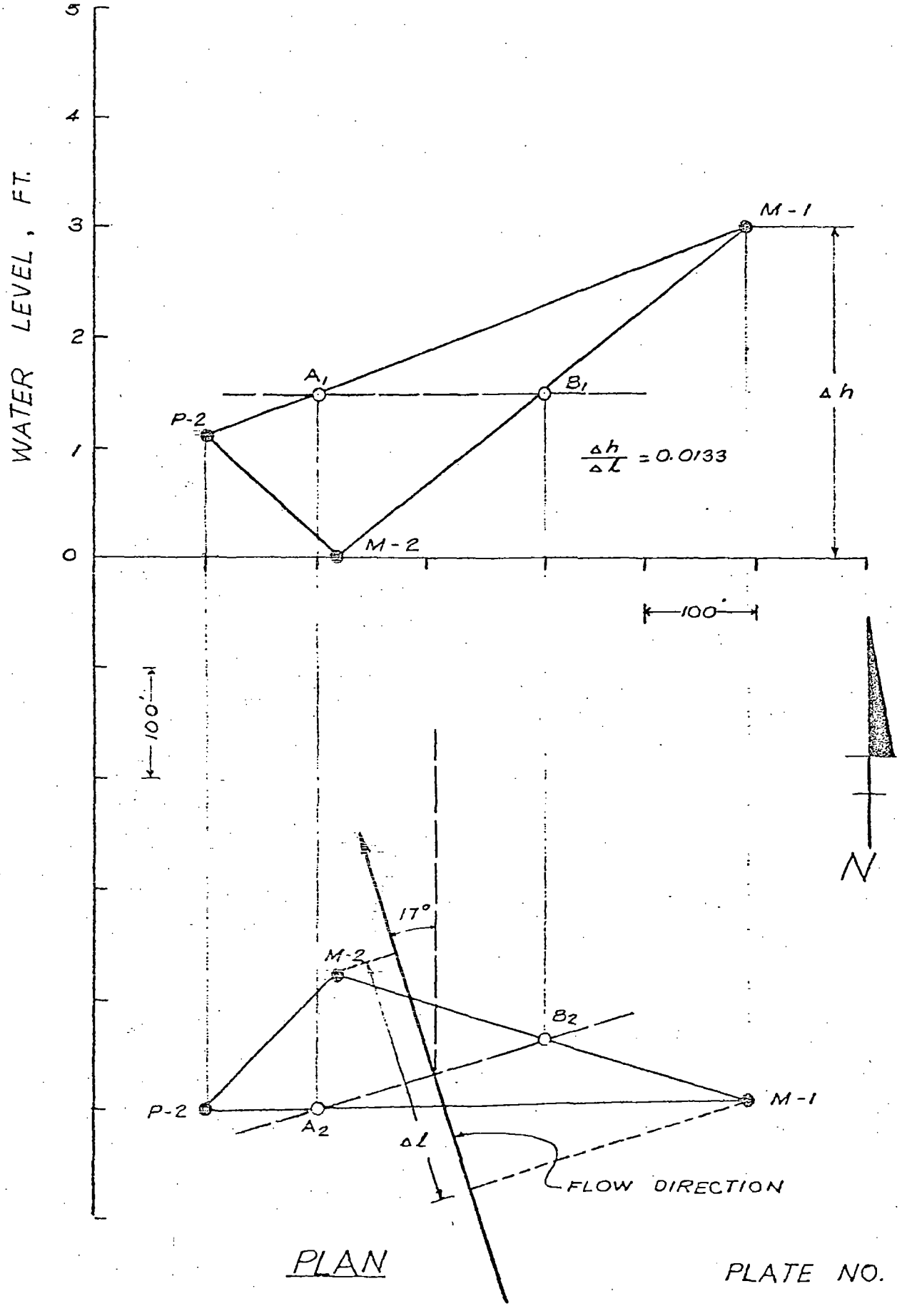

M-3
A1
B1
M-1
Δh
Δh/ΔL = 0.026
M-2
WATER LEVEL, FT.
0
1
2
3
4
5
6
100'
M-3
A2
100'
M-2
ΔL
B2
32.5°
M-1
FLOW DIRECTION
N
PLAN

PLATE NO. 3



PLAN

PLATE NO. 4

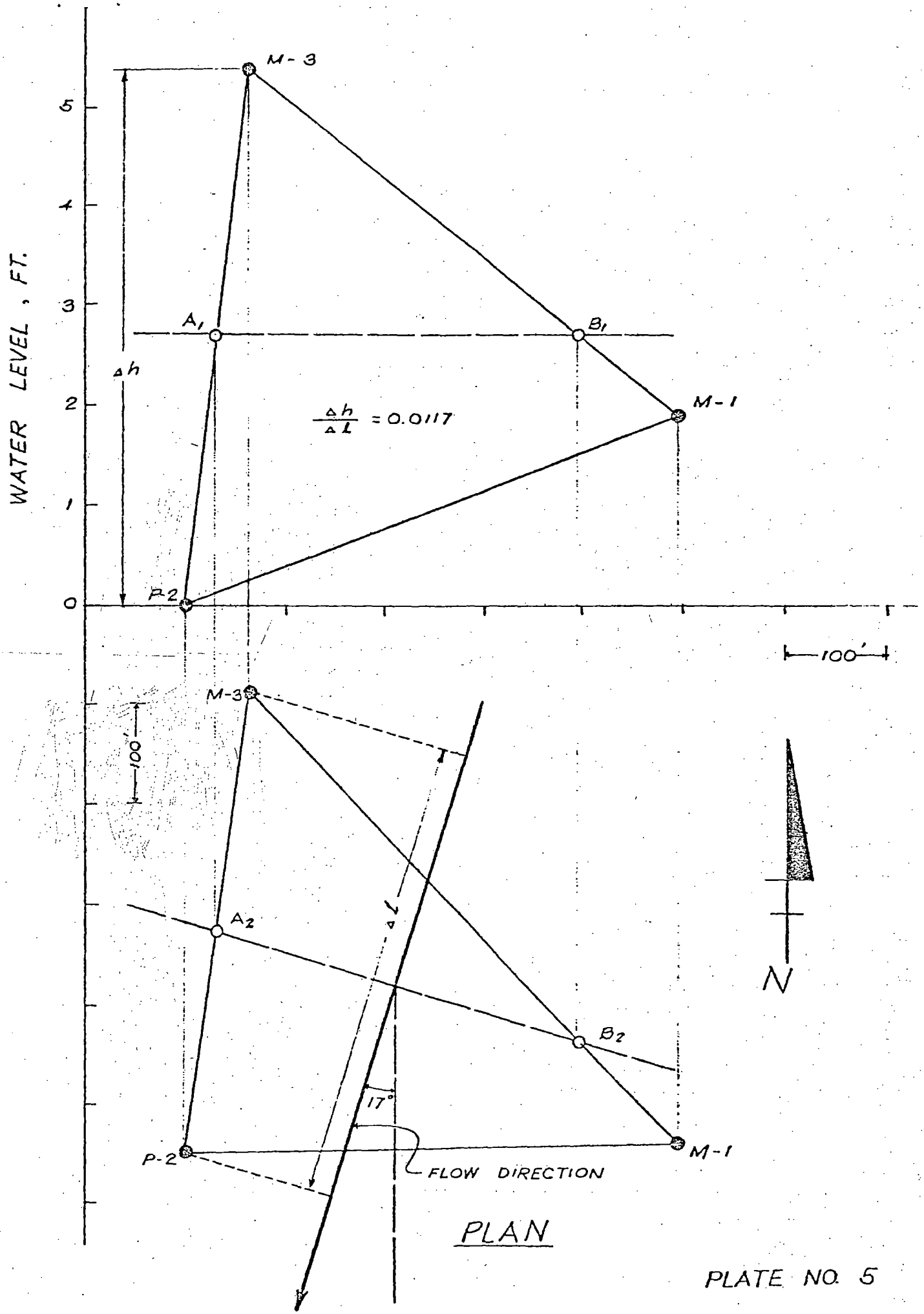

WATER LEVEL, FT.
M-3
A1
B1
M-1
P-2
Δh
Δh/Δl = 0.0117
100'
M-3
A2
B2
M-1
P-2
Δl
17°
FLOW DIRECTION
N
PLAN

PLATE NO. 5

A P P E N D I X

TEST BORING LOG

TEST HOLE M-1

FILE NO.: M-2178.143K

PROJECT: POND AREA - SODIUM PLANT - STATE ROAD - ASHTABULA, OHIO

FOR: THE RMI COMPANY - ASHTABULA, OHIO

ELEV. DATUM: DRILLED: DECEMBER 23, 1980 BY T. LATOS

ELEV. (FT.)	DEPTH (FT.)	LOG	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT	CLASSIFICATION
	0		1	SS	73-24-24	Miscellaneous Fill consisting of Sand and Crushed Concrete. Dense. Moist.
			2	SS	30/6"	
			3	SS	3-3-2	Brown COARSE AND MEDIUM SAND. Fill. Loose. Wet. (SP)
	5		4	SS	4-4-6	Brown and Gray Mottled SILTY CLAY. Chemical Odor noted. Stiff. Moist. (CL)
			5	SS	4-5-5	
			6	SS	5-7-8	Brown and Gray Layers of SILT and SILTY CLAY. Chemical Odor noted. Stiff. Wet. (ML) and (CL)
	10		7	SS	8-8-7	
			8	SS	6-9-14	Brown SILTY CLAY. Trace Sand. Some Silt Layers in formation. Chemical Odor noted. Stiff to Very Stiff. Moist. (CL)
			9	SS	9-10-14	
			10	SS	10-10-12	
	15		11	SS	11-14-16	
			12	SS	12-12-14	
			13	SS	12-16-20	Gray SILTY CLAY. Some Silt Layers in formation. Chemical Odor noted. Hard. Moist. (CL)
	20		14	SS	19-17-19	Gray SILT. Some Clay. Chemical Odor noted. Dense. Wet. (ML)
			15	SS	11-5-6	Gray SILTY CLAY. Some Silt Layers in formation. Chemical Odor noted. Stiff. Moist. (CL)
			16	SS	4-5-7	
	25					

GROUNDWATER:
ENCOUNTER: 4.0' & 21.5'
AT COMPLETION:
AFTER AT
TERMINAL DEPTH: 24.0'

HERRON CONSULTANTS, INC.
ENGINEERING • TESTING • INSPECTION

TEST BORING LOG

TEST HOLE M-2

FILE NO.: M-2178.143K

PROJECT: POND AREA - SODIUM PLANT - STATE ROAD - ASHTABULA, OHIO

FOR: THE RMI COMPANY - ASHTABULA, OHIO

ELEV. DATUM: DRILLED: JANUARY 9, 1981 BY T. LATOS

ELEV. (FT.)	DEPTH (FT.)	LOG	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT	CLASSIFICATION
	0					0 - 2.0' Sand, Clay and Brick. Fill. Frozen.
			1	SS	8-10-10	Brown and Gray SILTY CLAY. Some Sand. Trace Gravel. Chemical Odor noted. Fill. Very Stiff to Stiff. Moist. (CL)
			2	SS	6-8-9	
	5		3	SS	4-6-8	
			4	SS	5-5-9	Layers of Cinders and Brown Silty Clay. Chemical Odor noted. Fill. Stiff. Moist.
			5	SS	5-6-7	
	10		6	SS	6-6-6	
			7	SS	6-7-6	Brown SILTY CLAY. Chemical Odor noted. Stiff to Very Stiff. Moist. (CL)
			8	SS	5-7-8	
	15		9	SS	7-14-17	
			10	SS	12-15-19	
			11	SS	5-7-9	
			12	SS	6-6-8	
	20		13	SS	5-6-4	
			14	SS	4-6-9	Gray SILTY CLAY. Layers of Silt throughout formation. Chemical Odor noted. Stiff to Very Stiff. Moist. Wet at 26.0'. (CL)
			15	SS	4-4-3	
	25		16	SS	5-7-7	
			17	SS	6-7-3	
			18	SS	5-8-8	
	30		19	SS	6-6-9	
	35					

GROUNDWATER: ENCOUNTER: 12.0' & 27.0'

AT COMPLETION:

AFTER AT

TERMINAL DEPTH: 30.5'

HERRON CONSULTANTS, INC.
ENGINEERING - TESTING - INSPECTION

TEST BORING LOG

TEST HOLE M-3

FILE NO.: M-2178.143K

PROJECT: POND AREA - SODIUM PLANT - STATE ROAD - ASHTABULA, OHIO

FOR: THE RMI COMPANY - ASHTABULA, OHIO

ELEV. DATUM: DRILLED: DECEMBER 18, 1980 BY T. LATOS

ELEV. (FT.)	DEPTH (FT.)	LOG	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT	CLASSIFICATION
	0		1	SS	6-7-8	Mixture of Brown Silty Clay and Cinders. Fill. Stiff. Moist.
			2	SS	5-4-7	Brown CLAYEY SAND, Silty. Trace Gravel. Fill. Medium. Moist. (SC)
			3	SS	7-5-4	
	5		4	SS	5-4-5	Layers of Cinders and Brown Silty Clay. Fill. Stiff to Soft. Moist.
			5	SS	2-2-2	
			6	SS	2-4-5	
			7	SS	9-12-14	
	10		8	SS	12-14-17	Brown SILTY CLAY. Trace Sand. Very Stiff to Hard. Moist. (CL)
			9	SS	11-14-11	
			10	SS	7-14-14	
	15		11	SS	7-7-8	Gray SILT. Some Clay. Medium. Wet. (ML)
			12	SS	8-8-8	
			13	SS	7-10-11	
	20		14	SS	6-7-9	Gray SILTY CLAY. Some Silt Layers noted in formation. Very Stiff. Moist. (CL)
			15	SS	8-9-11	
			16	SS	7-10-14	
	25					

GROUNDWATER: ENCOUNTER: 16.0'

AT COMPLETION:

AFTER AT

TERMINAL DEPTH: 24.0'

HERRON CONSULTANTS, INC
ENGINEERING - TESTING - INSPECTION

TEST BORING LOG

TEST HOLE M-4

FILE NO.: M-2178.143K

PROJECT: POND AREA - SODIUM PLANT - STATE ROAD - ASHTABULA, OHIO

FOR: THE RMI COMPANY - ASHTABULA, OHIO

ELEV. DATUM: _____ DRILLED: JANUARY 20, 1981 BY T. LATOS

ELEV. (FT.)	DEPTH (FT.)	LOG	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT	CLASSIFICATION
	0					
			1	SS	4-4-5	Brown SILTY CLAY. Sand Lenses. Medium to Stiff. Moist. (CL)
	5		2	SS	5-6-8	
			3	SS	5-7-11	
	10		4	SS	8-9-14	Brown and Gray SILTY CLAY. Stiff. Moist. (CL)
	15		5	SS	5-7-8	Gray SILTY CLAY. Medium Stiff. Moist. (CL)
	20		6	SS	4-5-7	
	25		7	SS	12-15-16	Gray SILTY CLAY. Stiff. Moist to Wet. (CL)
	30		8	SS	6-7-9	Gray SILTY CLAY. Stiff. Moist to Wet. (CL)

GROUNDWATER: ENCOUNTER: 27.0'-SEEPAGE @ 23.0'

AT COMPLETION: 26.0'

AFTER 4 HOURS AT 12.7'

TERMINAL DEPTH: 30.0'

HERROX CONSULTANTS, INC.
ENGINEERING • TESTING • INSPECTION

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			GROUP SYMBOL	GRAPHIC SYMBOL	TYPICAL NAME
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS	GW		WELL GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
			GP		POORLY-GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES	GM		SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
			GC		CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SAND AND SANDY SOILS	CLEAN SAND	SW		WELL-GRADED SANDS OR GRAVELLY SANDS, LITTLE OR NO FINES
			SP		POORLY GRADED SANDS OR GRAVELLY SANDS, LITTLE OR NO FINES
		SAND WITH FINES	SM		SILTY SANDS, SAND-SILT MIXTURES
			SC		CLAYEY SANDS, SAND-SILT MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS LL<50		ML		INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL		INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL		ORGANIC SILTS AND ORGANIC SILT-CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LL>50		MH		INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTLY SOILS, ELASTIC SOILS
			CH		INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAY
			OH		ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			Pt		PEAT AND OTHER HIGHLY ORGANIC SOILS

BOULDERS — COARSER THAN 6 INCHES

COBBLES — 3 INCHES TO 6 INCHES

GRAVEL

COARSE — .75 INCHES TO 3 INCHES

FINE — 4.76 MM. TO .75 INCHES

SAND

COARSE — 2.00 MM. TO 4.76 MM.

MEDIUM — .42 MM. TO 2.00 MM.

FINE — .074 MM. TO .42 MM.

SILT — .005 MM. TO .074 MM.

CLAY — FINER THAN .005 MM.

PER ASTM D 2487

HERROD CONSULTANTS, INC.

ENGINEERING - TESTING - INSPECTION

GENERAL NOTES FOR TEST BORING LOGS

ENTERED UNDER SAMPLE TYPE:

CA — Continuous Flight Auger Sample
HA — Hand Auger Sample

Disturbed sample obtained from auger flight.

SS — Split Barrel Sample (2" O.D., 1.375" I.D.)*

Driven sampler for disturbed sample.

ST-2 — Thin-Walled Shelby Tube Sample (2" O.D., 1.875" I.D.)
ST-3 — Thin-Walled Shelby Tube Sample (3" O.D., 2.875" I.D.)
PT — Thin-Walled Piston Tube Sample

Static force pressed sampler for "undisturbed" sample.

LS — Sectional Liner Sample (Ring Shear)

W — Wash Sample

Obtained from churn-drive boring methods.

DC — Diamond Rock Core Barrel Sample (unspecified size)
NX — 2.125" I.D. Diamond Rock Core Barrel Sample
BX — 1.625" I.D. Diamond Rock Core Barrel Sample
AX — 1.1875" I.D. Diamond Rock Core Barrel Sample

ENTERED UNDER SAMPLE NO.:

2 — Indicates sample number and acquisition interval.

ENTERED UNDER BLOW COUNT:

EXAMPLE: 6/9/12 — The number of blows of a 140-pound hammer, free falling through a distance of 30 inches, required to drive a standard (2" O.D., 1.375" I.D.) split barrel sampler into the soil, including an initial six-inch seating penetration. Blows recorded in 6-inch increments for a distance of 18 inches.

EXAMPLE: 60/2" — The number of blows (60) required to drive a standard split barrel sampler for a distance (2") of less than one foot.

SSR — Split barrel sampler penetration refusal at advance of less than one inch for 50 blows.

AR — Auger refusal.

(*) Other diameters, when employed, are noted on Boring Log.

THE KOSKI CONTRACTORS CONSTRUCTION CO.
5841 WOODMAN AVENUE
PHONES: 216/997-5337 — 997-9266
PLANT — EAST 5TH ST. PHONE 964-8171
ASHTABULA, OHIO 44004

clay for landfill cover & Steam relocation can from there people - Did the work

September 21, 1981

RMI Co.
P.O. Box 490
Ashtabula, OH 44004

ATTENTION: Larry Hanek

Dear Sir:

Please find enclosed a report on the geological conditions of the clay being used for the pond closeout.

If you have any questions, please do not hesitate to contact me.

Very truly yours,

THE KOSKI CONSTRUCTION COMPANY

Donald R. Koski

Donald R. Koski
Vice-President

DRK/bq

Enclosure

SUMMARY OF SITE GEOLOGY AND SOILS

General Geologic Conditions

The proposed site is located on the Erie Lake Plain, within the Eastern Lake Section of the Central Lowlands physiographic province. This physiographic province is characterized by a layer of nearly flat-lying sedimentary strata overlying a stable basement complex and having a veneer of glacial and alluvial deposits. The province also typically has low elevations and slight local relief.

The bedrock which underlies the site has been mapped as the Conneaut Group, an Upper Devonian deltaic deposit of interbedded shale, siltstone and fine-grained sandstone with occasional thin limestone. At the site, the thickness of the unit is probably considerably less than the maximum of 430 feet. Bedrock uniformly underlies the site at depths slightly less than 50 feet. Structurally, the strata is nearly horizontal, dipping slightly southward approximately 15 feet per mile. Faulting is not evident in close proximity to the site. Joint orientation and the degree of fracturing of the bedrock has not yet been investigated.

The proposed site is mantled with about 50 feet of glacial and associated lacustrine deposits. These deposits consist of 40 to 45 feet of till (a non-stratified, non-sorted, ice-deposited heterogeneous mixture of clay, silt, sand, and gravel) with thin interbeds of very poorly sorted outwash sands. The till is overlain by a thin veneer of lacustrine silt, deposited in the past while Lake Erie was at much higher levels.

According to the Unites States Geologic Survey (USGS), the site lies in an area of relatively low seismic frequency where minor damage from earthquakes may occur (Hadley and Devine, 1974). A seismic risk map compiled by Algermissen shows the site very close to the border between areas of minor and moderate expected damage due to earthquakes.

General Soil Conditions and Results of Testing

Two major types of soils or unconsolidated sediments totaling almost 50 feet in thickness were encountered during a test boring investigation. The bottom 40 feet of these soils is till, while the remaining 8 to 10 feet near the surface is comprised of lake sediments.

The till is gray, calcareous, and does not show evidence of being weathered. It is tightly compacted, with density generally increasing with depth. Texturally, the till is mostly silt with lesser amounts of clay and fine sand. Various-sized angular pebbles having smooth surfaces occur randomly in the finer matrix. These pebbles consist of limestone and fine grained clastic rock, reflecting the bedrock types occurring in the region. The texture is similar to that which is described by the USGS as "a silty, clayey till, sparingly to moderately pebbly and containing few cobbles and scattered boulders" as the Ashtabula till (White, G. W., 1960).

The permeability of the till with respect to acid and water was tested by W&W Testing of Pittsburgh, Pennsylvania There was no flow of acid observed to occur through the till with either a 10' (8 hours) or 40' (24 hours) constant head. No flow of water was observed to occur through the soil with a 10' (5 hours) head, but a slight flow of 6.62×10^{-7} cm/sec was recorded with a 40' head (1 hour). The significance of these tests and the results are still being evaluated.

The sediments lying above the till are predominantly silt and very fine sand with lesser amounts of clay. This deposit may have been derived from till that was reworked in a near-shore zone during former high lake levels.

A detailed, comprehensive report on the geology and soils of the site will be submitted with the application for permit. This report will include the results and a discussion of the soils tests.

STATE OF OHIO
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGICAL SURVEY
RALPH J. BERNHAGEN, CHIEF

BULLETIN 44

GEOLOGY OF WATER IN OHIO

by

Wilber Stout, Karl Ver Steeg,

and G. F. Lamb

COLUMBUS

1943

Reprinted without revision 1968

Glaciation: The village lies on the terminal moraine of the Wisconsin glacier. Regionally the drift is erratic and variable in thickness, ranging from 20 to 200 feet.

Floor level: The Deep Stage Utica River formerly flowed along the present course of Black Fork. The rock floor of this old stream stands at an elevation of about 830 feet and consequently the fill is approximately 170 feet in thickness. It provides abundant water.

Rocks: The country rocks are in the Waverly group, near the top of the Cuyahoga formation. The Berea sandstone stands at an elevation not far from 500 feet with thus some 500 feet of shales, shaly sandstones, and thin layers of the Black Hand formation above.

Brine: Brine is encountered in all deep tests.

Present supply: The first public water supply system was established in 1894 and consisted of one 6-inch well 93 feet deep, 53 feet of which is sandstone. Other wells have been drilled as needed. The water is untreated.

Possibilities: The thick fill of the valley offers large supplies.

POLK

Population: 275

Streams: This village lies on the glaciated, moderately rolling Allegheny Plateau, at the level of the Harrisburg peneplain, near the crest of a dividing ridge, at an elevation approximating 1,276 feet, and at the headwaters of several small streams. Redhaw Creek rises to the east of the village, Katotawa Creek to the south, and a branch of Orange Creek to the west.

Glaciation: The Wisconsin glacier passed over the area. The village lies near the crest of the Wabash moraine, the general thickness of drift on which is from 40 to 80 feet. At Polk it is reported about 50 feet.

Floor level: No buried valleys are known in the area.

Rocks: The country rocks belong in the Waverly group, in the Cuyahoga formation. The Berea sandstone is present at an elevation of about 520 feet or approximately 756 feet below the village. The prospects for rock water are poor.

Brine: Brine is encountered in all deep tests.

Present supply: The present supply, 1941, is from common wells in the glacial drift.

Possibilities: The morainic drift offers the most favorable supply.

ROWSBURG

Population: 100

Streams: Rowsburg lies on the glaciated, moderately hilly Allegheny Plateau, on the point of a low hill, at an elevation approximating 1,100 feet, and three-fourths mile west of the Middle Fork of the Mohican River.

Glaciation: The area was glaciated by the Wisconsin ice sheet. Regionally the drift is from 25 to 75 feet in thickness. At the village a measurement shows 71 feet.

Floor level: The floor of the Deep Stage stream occupying the present valley of Middle Fork stands at an elevation of 856 feet. The fill is 124 feet in thickness and contains considerable sand and gravel.

Rocks: The country rocks belong in the Waverly group of the Cuyahoga formation. The Berea sandstone is found at an elevation of 365 feet and the Logan-Cuyahoga formation contact at 1,030 feet. The chances for rock water are poor.

Brine: Brine is encountered in all deep tests.

Present supply: The present water supply, 1941, is from common wells in the glacial deposits.

Possibilities: The chief water resource is the thick fill along the valley of Middle Fork.

SULLIVAN

Population: 267

Streams: Sullivan lies on the glaciated, relatively smooth Allegheny Plateau, at an elevation of 1,136 feet (B. M.), and with only mere runs in the immediate vicinity. The West Fork of the Black River, also a small run, lies one and one-half miles north.

Glaciation: The area was abraded by the Wisconsin ice sheet. The village lies at the south edge of the Defiance or Blanchard moraine (south extension). The general thickness of the drift in this vicinity is about 50 feet.

Floor level: No buried valleys are known in this area.

Rocks: The Berea sandstone is found at an elevation of approximately 570 feet or 566 below the surface. Therefore the rock section begins about the contact of the Logan and Cuyahoga formations of the Waverly group. The chances for rock water are poor.

Brine: Brine is encountered in all deep tests.

Present supply: The water supply, 1941, is from common wells in the glacial drift.

Possibilities: The chief resource is the gravel layers in the glacial deposits along the flank of the Blanchard moraine.

ASHTABULA COUNTY

ANDOVER

Population: 945

Streams: Andover is placed on the glaciated, rolling Allegheny Plateau, on a broad flat ridge, at an elevation approximately 1,091 feet (B. M.), nearly three miles west of the Pymatuning River, and near the headwaters of small runs.

Glaciation: Two glaciers, the Wisconsin and the Kansan or pre-Kansan, passed over the area. The village lies on the east flank of the Cleveland moraine which here is not especially prominent. Locally the drift is thin, varying from 5 to 25 feet.

Floor level: No buried valley is known in the immediate vicinity.

Rocks: Andover lies at the base of the Cuyahoga formation not far above the Berea sandstone. The Berea-Bedford contact is found at an elevation not far from 1,000 feet. The following record taken in the northeastern part of the village shows its position.

	Top Feet	Bottom Feet
Clay and loose sand	0	4
Sandstone, fine, shaly	4	14
Sandstone, hard, firm	14	29
Sandstone, very hard	29	36
Shale	36	78
Sandstone, coarse, bearing water, *Berea*.	78	91
Sandstone, shaly	91	144

Water is obtained in good volume on entering the Berea sandstone, but the volume increases toward the base of the formation. The water is of good quality.

Sulphur water and brine: Deep drilling below the Berea sandstone encounters only sulphur water or brine.

Present supply: The supply, 1941, is ground water untreated.

Possibilities: The Berea sandstone is the only immediate source for a water supply.

ASHTABULA

Population: 21,405

Streams: Ashtabula is located on the glaciated Lake Plain, about one mile north of the border of the Lake Escarpment moraine, some three miles north of the Portage escarpment, with the beach ridge of old Lake Whittlesey at the south end of the town and the beach ridge of old Lake Warren extending through the central portion, directly west of the Ashtabula River, south of Lake Erie, and at an elevation approximating 700 feet. (B. M.)

Glaciation: The two ice sheets, Wisconsin and Kansan or pre-Kansan, passed over the area but left only a thin coating of drift, on the average not more than 25 feet.

Floor level: No buried valleys are known in the area. The Ashtabula River flows on or close to rock at an elevation not far from 585 feet.

Rocks: The rocks exposed are the siliceous shales and thin, hard sandstones of the massive Chagrin formation. They bear no or little rock water.

Present supply: The supply, 1941, is Lake Erie water filtered before use.

Possibilities: The chief sources are Lake Erie and the Ashtabula River.

ASHTABULA HARBOR

Streams: This town is located on the glaciated Lake Plain, directly south of Lake Erie, west of the Ashtabula River, and at an elevation around 625 feet.

Glaciation: The area was abraded by both the Wisconsin and the older Kansan or pre-Kansan ice sheets. The drift, however, is thin, usually less than 25 feet.

Floor level: No deeply entrenched, buried valleys are known in the area.

Rocks: The rocks exposed in the area are the siliceous shales and thin, hard sandstones of the Chagrin formation bearing no or little water.

Sulphur water and brine: Deep tests yield only sulphur water or brine unfit for human consumption.

Present supply: The supply, 1941, is water from Lake Erie filtered before use.

Possibilities: The chief water resource is Lake Erie.

AUSTINBURG.
Population: 300

Streams: This village is placed on the glaciated Allegheny Plateau, on the Portage escarpment, just south of the Lake Escarpment moraine, at an elevation approximating 817 feet (B. M.), one and one-fourth miles northeast of the Grand River, and on Coffee Creek draining several square miles of swampy area.

Glaciation: Two ice sheets, Wisconsin and Kansan or pre-Kansan, passed over the area. The drift is erratic, ranging from 10 to 100 feet.

Floor level: No buried valley of prominence is known in the area.

Rocks: The underlying rocks are the siliceous shales and thin, hard sandstones of the Chagrin formation bearing no or little water.

Sulphur water and brine: Either sulphur water or brine is encountered in all deep tests.

Present supply: The supply, 1941, is from common wells.

Possibilities: The water resources are confined to the thin drift, to Coffee Creek direct, and to the Grand River.

CONNEAUT
Population: 9,355

Streams: Conneaut is placed on the glaciated Lake Plain, north of the beach ridge of old Lake Warren, south of Lake Erie, north and west of Conneaut Creek, at an elevation of 662 feet (B. M.), two miles north of the Lake Escarpment moraine, and four miles north of the Portage escarpment.

Glaciation: The area was glaciated by both the Wisconsin and the older Kansan or pre-Kansan ice sheets but, in general, was covered with only a thin coating of drift, averaging less than 25 feet.

Floor level: No buried valley of any importance is known in the area.

Rocks: The country rocks are siliceous shales and thin, hard sandstones of the Chagrin formation bearing no or little water.

Sulphur water and brine: Deep drilling is of no avail as only sulphur water or strong brine is encountered.

Present supply: The supply, 1941, is water from Lake Erie filtered before use.

Possibilities: Surface water, either from Lake Erie or from Conneaut Creek, is all that is offered.

DORSET
Population: 350

Streams: This village is placed on the rather flat, glaciated Allegheny Plateau, at an elevation not far from 985 feet (B. M.), and from one-half to three-fourths mile east of Mill Creek draining a few square miles of swampy basin.

Glaciation: Both the Wisconsin and the older Kansan or pre-Kansan ice sheets passed over the area. Near the village the drift is thin and erratic.

Floor level: A shallow Teays Stage Valley is present about one mile west of the village. Here the rock floor stands at an elevation of around 925 feet and the fill is from 30 to 40 feet in thickness.

Rocks: Dorset lies near the top of the great thickness of Ohio shale. This means no or little rock water.

Sulphur water and brine: Deep drilling yields only sulphur water or brine.

Present supply: The supply, 1941, is from common wells.

Possibilities: The water resources are confined to the thin drift and to Mill Creek direct.

GENEVA
Population: 4,171

Streams: This town is placed on the Lake Plain, about one mile north of the border of the Lake Escarpment moraine, nearly three-fourths mile north of the beach ridge of old Lake Whittlesey, on the beach ridge of old Lake Warren, about two miles north of the base of the Portage escarpment, at an elevation approximating 680 feet, and just west of Cowles Creek, draining only a few square miles above the town.

Glaciation: Two ice sheets, Wisconsin and Kansan or pre-Kansan, passed over the area. The drift is thin, averaging less than 25 feet, and consists largely of till.

Floor level: No buried valley of prominence is present in the area.

Rocks: The underlying rocks are siliceous shales and thin, hard sandstones of the Chagrin formation yielding no or little water.

Sulphur water and brine: The nature of the rocks is such that all deep tests encounter only sulphur water or brine.

Present supply: The supply, 1941, is surface water filtered before use.

Possibilities: Large supplies must come from Lake Erie about four miles to the north or from the Grand River about the same distance from the south.

JEFFERSON
Population: 1,676

Streams: This town is located on the glaciated, rather smooth Allegheny Plateau, at an elevation not far from 968 feet (B. M.), and in a large bow of Mill Creek, about two miles distant from the stream to the west, north, and east.

Glaciation: The area was abraded by both the Wisconsin and the older Kansan or pre-Kansan ice sheets. The drift, however, is generally thin, averaging not more than 25 feet.

Floor level: No buried valleys of importance are present in the area.

Rocks: The rocks exposed at places along Mill Creek are the dense, gray shales and thin, hard sandstones belonging in the upper portion of the Chagrin formation. Such conditions preclude rock water.

Sulphur water and brine: In deep tests the drill reveals only sulphur water or brine unfit for human consumption.

Present supply: The supply, 1941, is surface water from Mill Creek filtered before use.

Possibilities: The chief water resource is Mill Creek.

KELLOGGSVILLE
Population: 125

Streams: This small village is located on the glaciated, gently rolling Allegheny Plateau, on the flood plain and wall of the Ashtabula River north of the stream, and at an elevation approximating 855 feet.

Glaciation: Both the Wisconsin and the earlier Kansan or pre-Kansan ice sheets passed over the area. The village lies at the southern border of the Lake Escarpment moraine with drift from 30 to 100 feet or more in thickness.

Floor level: The rock floor of the Ashtabula River is not far from an elevation of 790 feet. The fill is thus some 50 feet in thickness.

Rocks: The country rocks are siliceous shales and thin, dense sandstones near the top of the Chagrin formation. Such a position precludes rock water.

Sulphur water and brine: Deep drilling into or through the Ohio shale will yield only sulphur water or brine.

Present supply: The supply, 1941, is from common wells.

Possibilities: The chief water resources are the fill in the valley, the thick drift north of the village, and the Ashtabula River direct.

KINGSVILLE
Population: 834

Streams: This village is placed on the glaciated Lake Plain, at the foot of the Portage escarpment, on the beach ridge of old Lake Whittlesey, and about one mile south of that of Lake Warren, at an elevation approximating 780 feet, and on the upland west of Conneaut Creek in the most western extension of the loop.

Glaciation: Both the older Kansan or pre-Kansan and the later Wisconsin ice sheets passed over the area. Kingsville lies just north of the Lake Escarpment moraine. The drift, however, is generally thin, from 20 to 50 feet.

Floor level: No well-defined buried valleys are known in the area.

Rocks: The rocks outcropping along Conneaut Creek are siliceous shales and thin, hard sandstones of the Chagrin formation. Such conditions preclude rock water.

Sulphur water and brine: All deep tests yield only sulphur water or brine unfit for human consumption.

Present supply: The supply, 1941, is from common wells in the drift or the sands of the old lake beach.

Possibilities: Conneaut Creek offers the only supply of any importance.

ORWELL
Population: 579

Streams: This village lies on the glaciated, rather smooth Allegheny Plateau, on a broad flat ridge, at an elevation of 902 feet (B. M.), one and one-half miles east of the Grand River, and with only mere runs in the immediate vicinity.

RMI TITANIUM

RMI Company

SODIUM PLANT

P. O. BOX 550
ASHTABULA, OHIO 44004
216/997-5141 TWX 810-427-2937

September 29, 1980

Mr. William T. Skowronski, P.E.
Group Chief
Industrial Wastewater Division
Ohio Environmental Protection Agency
Northeast District Office
2110 E. Aurora Road
Twinsburg, Ohio 44087

Dear Mr. Skowronski:

I am enclosing a copy of the results of the analyses performed on the split samples obtained from the OEPA on numerous dates, starting in April, 1980.

If you have any further questions regarding these test results, please call.

Very truly yours,

RMI COMPANY

L. S. Hanek
Plant Manager

LSH:hm

Encls: Tables I, II, III

Ohio Department of Health
Sanitary Chemistry Section

Environmental Sample Submission Report

Agency: OEPA
Division Program: DW20
Analysis Reported To: ☐ CO ☐ CDO ☐ SE ☒ NE ☐ SW ☐ NW

Laboratory: ☐ Central ☐ SE ☐ NE ☐ SW ☐ NW
Sample Number: 32026
Analyst: _____ Supervisor: Sallum
Date Received: 5/1/80
Date Reported: 6-5-80

Sample Identification

Station: RMT Sodium Plant
ID Number: SC, _____
Address: 002 (coal pile Runoff)
City: _____ Zip: _____
County: Ashtabula Phone: _____
Collected By: Wysenski

Grab Sample Date or Beginning Date of Composite Sample—Use Military Time

Year	Month	Day	Hour	Minute
80	04	30		

Ending Date of Composite Sample—Use Military Time

Year	Month	Day	Hour	Minute	CVT	S/T	TYP

Field Treatment:
☐ Filtered ☐ $CuSO_4 - H_3PO_4$
☐ Iced ☐ H_2SO_4
☐ NaOH ☐ HNO_3
☐ Other (Explain)

Additional Information—Analyst Remarks—Non Routine Analytical Requests
Compliance Monitor

(5)

☐ Sample Code	P115,	☐ Conductivity, Field, U-MHO	P94,	☐ Chlorine Total Resd mg/l	P50060,
☐ pH, Field S.U.	P400,	☐ Flow, Instantaneous CFS	P61,	☐ Water Temperature, Field	P10,
☐ Dissolved Oxygen, Field mg/l	P300,	☐ Hydrogen Sulfide mg/l	P71875,	☐ Sample Purpose	P71999,
☐ Stream Gage	P65,	☐ Chlorine Free Avl, Field mg/l	P50064,	☐	

☐ Regular (or indicate by checking boxes)		☐ Phosphorus Sol, P mg/l	P666,	☐ Lithium Total, Li ug/l	P1132,
☐ Turbidity FTU	P76,	☐ Phosphate Reactive P mg/l	P70507,	☒ Manganese Total, Mn ug/l	P1055, 7200
☐ Color Pt-Co	P80,	☐ Chloride, Cl mg/l	P940,	☒ Mercury Total, Hg ug/l	P71900, 1.7
☐ Conductivity at 25°C U-MHO	P95,	☐ Fluoride Total, F mg/l	P951,	☐ Molybdenum Total, Mo ug/l	P1062,
☒ pH, Lab S.U.	P403, 3.0	☐ Cyanide,CN mg/l	P720,	☐ Nickel Total, Ni ug/l	P1067,
☐ pH, $CaCO_3$ Stability S.U.	P70311,	☐ Silica, Diss. Si mg/l	P955,	☐ Selenium Total, Se ug/l	P1147,
☐ Alkalinity Total, $CaCO_3$ mg/l	P410,	☐ Calcium Total, Ca mg/l	P916,	☐ Silver Total, Ag ug/l	P1077,
☐ Alkalinity Phth, $CaCO_3$ mg/l	P415,	☐ Magnesium Total, Mg mg/l	P927,	☐ Strontium Total, Sr ug/l	P1082,
☐ Alkalinity $CaCO_3$ Stabl, mg/l	P74023,	☐ Sodium Total, Na mg/l	P929,	☐ Thallium Total, Tl ug/l	P1059,
☐ Acidity Total, $CaCO_3$ mg/l	P70508,	☐ Potassium Total, K mg/l	P937,	☐ Tin Total, Sn ug/l	P1102,
☐ Acidity M.O. $CaCO_3$ mg/l	P436,	☐ Aluminum Total, Al ug/l	P1105,	☐ Titanium Total, Ti ug/l	P1152,
☒ Hardness Total, $CaCO_3$ mg/l	P900, 5500	☐ Antimony Total, Sb ug/l	P1097,	☐ Vanadium Total, V ug/l	P1087,
☐ Residue, Total mg/l	P500,	☐ Arsenic Total, As ug/l	P1002,	☒ Zinc Total, Zn ug/l	P1092, 600
☐ Residue, Total Volatile mg/l	P505,	☐ Barium Total, Ba ug/l	P1007,	☐ Carbon Total, Organic C mg/l	P680,
☐ Residue, Total Nfilt (Sus) mg/l	P530,	☐ Berylium Total, Be ug/l	P1012,	☐ Carbon Diss, Organic C mg/l	P681,
☐ Residue, Vol, Nfilt mg/l	P535,	☐ Bismuth Total, Bi ug/l	P1017,	☐ Phenol ug/l	P32730,
☐ Residue, Total Filt (Diss) mg/l	P70300, 16458	☐ Boron Total, B ug/l	P1022,	☐ MBAS mg/l	P38260,
☐ Residue, Vol Filt mg/l	P520,	☐ Cadmium Total, Cd ug/l	P1027,	☐ Oil-Grease, Total mg/l	P556,
☐ Residue, Settlable ml/l	P545,	☒ Chromium Total, Cr ug/l	P1034, 30	☐ BOD, 5-Day mg/l	P310,
☐ Sulfate, SO_4 mg/l	P945,	☐ Chromium Hex, Cr ug/l	P1032,	☒ COD mg/l	P335, 630
☐ Nitrogen TKN, N mg/l	P625,	☐ Cobalt Total, Co ug/l	P1037,	☐ TOD mg/l	P343,
☐ Nitrogen Ammonia, N mg/l	P610,	☒ Copper Total, Cu ug/l	P1042, 120	☐	
☐ Nitrate-Nitrite, N mg/l	P620,	☒ Iron Total, Fe ug/l	P1045, 30500	☐	
☐ Nitrite, N mg/l	P615,	☐ Iron Diss., Fe ug/l	P1046,	☐	
☐ Phosphorus Total, P mg/l	P665,	☒ Lead Total, Pb ug/l	P1051, 70	☐	

Distribution: 1—Data Processing 2—Central Office 3—District Office 4—Owner 5—Laboratory

o Department of Health
ary Chemistry Section

Environmental Sample Submission Report

Agency: OEPA
Division Program: DW20
Analysis Reported To: ☐ CO ☐ CDO ☐ SE ☒ NE ☐ SW ☐ NW

Laboratory: ☒ Central ☐ SE ☐ NE ☐ SW ☐ NW
Sample Number: 32025
Analyst: _____ Supervisor: Saulsbury
Date Received: 5/1/80
Date Reported: 6-5-80

Sample Identification

Station: RMT Sodium Plant
ID Number: SC, _ _ _ _ _ _ _ _ _ _,
Address: 001
City: _____ Zip: _____
County: Ashtabula Phone: _____
Collected By: Wyszulski

Grab Sample Date or Beginning Date of Composite Sample—Use Military Time

Year	Month	Day	Hour	Minute
80	04	29	10	35

Ending Date of Composite Sample—Use Military Time

Year	Month	Day	Hour	Minute	CVT	S/T	TYP
80	04	30	09	35			

Field Treatment:
☐ Filtered ☐ $CuSO_4 + H_3PO_4$
☐ Iced ☐ H_2SO_4
☐ NaOH ☐ HNO_3
☐ Other (Explain)

Additional Information—Analyst Remarks—Non Routine Analytical Requests
Compliance Monitor
Company's Sample

☐ Sample Code	P115.	☐ Conductivity, Field, U-MHO	P94.	☐ Chlorine Total Resd mg/l	P50060.
☐ pH, Field S.U.	P400.	☐ Flow, Instantaneous CFS	P61.	☐ Water Temperature, Field	P10.
☐ Dissolved Oxygen, Field mg/l	P300.	☐ Hydrogen Sulfide mg/l	P71875.	☐ Sample Purpose	P71999.
☐ Stream Gage	P65.	☐ Chlorine Free Avl, Field mg/l	P50064.	☐	

☐ Regular (or indicate by checking boxes)		☐ Phosphorus Sol, P mg/l	P666.	☐ Lithium Total, Li ug/l	P1132.
☐ Turbidity FTU	P76.	☐ Phosphate Reactive P mg/l	P70507.	☐ Manganese Total, Mn ug/l	P1055.
☐ Color Pt-Co	P80.	☐ Chloride, Cl mg/l	P940.	☒ Mercury Total, Hg ug/l	P71900.
☐ Conductivity at 25°C U-MHO	P95.	☐ Fluoride Total, F mg/l	P951.	☐ Molybdenum Total, Mo ug/l	P1062.
☒ pH, Lab S.U.	P403. 7.3	☐ Cyanide,CN mg/l	P720.	☐ Nickel Total, Ni ug/l	P1067.
☐ pH, $CaCO_3$ Stability S.U.	P70311.	☐ Silica, Diss. Si mg/l	P955.	☐ Selenium Total, Se ug/l	P1147.
☐ Alkalinity Total, $CaCO_3$ mg/l	P410.	☐ Calcium Total, Ca mg/l	P916.	☐ Silver Total, Ag ug/l	P1077.
☐ Alkalinity-Phth, $CaCO_3$ mg/l	P415.	☐ Magnesium Total, Mg mg/l	P927.	☐ Strontium Total, Sr ug/l	P1082.
☐ Alkalinity $CaCO_3$ Stabl, mg/l	P74023.	☐ Sodium Total, Na mg/l	P929.	☐ Thallium Total, Tl ug/l	P1059.
☐ Acidity Total, $CaCO_3$ mg/l	P70508.	☐ Potassium Total, K mg/l	P937.	☐ Tin Total, Sn ug/l	P1102.
☐ Acidity M.O. $CaCO_3$ mg/l	P436.	☐ Aluminum Total, Al ug/l	P1105.	☐ Titanium Total, Ti ug/l	P1152.
☒ Hardness Total, $CaCO_3$ mg/l	P900. 216	☐ Antimony Total, Sb ug/l	P1097.	☐ Vanadium Total, V ug/l	P1087.
☐ Residue, Total mg/l	P500.	☐ Arsenic Total, As ug/l	P1002.	☒ Zinc Total, Zn ug/l	P1092. 60
☐ Residue, Total Volatile mg/l	P505.	☐ Barium Total, Ba ug/l	P1007.	☐ Carbon Total, Organic C mg/l	P680.
☒ Residue, Total Nfilt (Sus) mg/l	P530. 29	☐ Berylium Total, Be ug/l	P1012.	☐ Carbon Diss, Organic C mg/l	P681.
☐ Residue, Vol, Nfilt mg/l	P535.	☐ Bismuth Total, Bi ug/l	P1017.	☒ Phenol ug/l	P32730.
☒ Residue, Total Filt (Diss) mg/l	P70300. 740	☐ Boron Total, B ug/l	P1022.	☐ MBAS mg/l	P38260.
☐ Residue, Vol Filt mg/l	P520.	☐ Cadmium Total, Cd ug/l	P1027.	☐ Oil-Grease, Total mg/l	P556.
☐ Residue, Settlable ml/l	P545.	☒ Chromium Total, Cr ug/l	P1034. <30	☐ BOD, 5-Day mg/l	P310.
☐ Sulfate, SO_4 mg/l	P945.	☐ Chromium Hex, Cr ug/l	P1032.	☐ COD mg/l	P335.
☐ Nitrogen TKN, N mg/l	P625.	☐ Cobalt Total, Co ug/l	P1037.	☐ TOD mg/l	P343.
☐ Nitrogen Ammonia, N mg/l	P610.	☒ Copper Total, Cu ug/l	P1042. 90	☐	
☐ Nitrate-Nitrite, N mg/l	P620.	☒ Iron Total, Fe ug/l	P1045. 1620	☐	
☐ Nitrite, N mg/l	P615.	☐ Iron Diss., Fe ug/l	P1046.	☐	
☐ Phosphorus Total, P mg/l	P665.	☒ Lead Total, Pb ug/l	P1051. 8	☐	

Distribution: 1—Data Processing 2—Central Office 3—District Office 4—Owner 5—Laboratory

Department of Health
Laboratory Chemistry Section

Environmental Sample Submission Report

Agency: OEPA
Division Program: WD20
Analysis Reported To: ☐ CO ☐ CDO ☐ SE ☒ NE ☐ SW ☐ NW

Laboratory: ☐ Central ☐ SE ☐ NE ☐ SW ☐ NW
Sample Number: 32024
Analyst: _____ Supervisor: Williams
Date Received: 5/1/80
Date Reported: 6-5-80

Sample Identification

Station: RMI Sodium Plant
ID Number: SC, _____
Address: 601
City: _____ Zip: _____
County: Ashtabula Phone: _____
Collected By: Wysenski - Buda

Grab Sample Date or Beginning Date of Composite Sample—Use Military Time

Year	Month	Day	Hour	Minute
80	04	29	10	35

Ending Date of Composite Sample—Use Military Time

Year	Month	Day	Hour	Minute	CVT	S/T	TYP
80	04	29	09	35			

Field Treatment:
☐ Filtered ☐ $CuSO_4 - H_3PO_4$
☐ Iced ☐ H_2SO_4
☐ NaOH ☐ HNO_3
☐ Other (Explain)

Additional Information—Analyst Remarks—Non Routine Analytical Requests

Compliance Monitor
OEPA Sample From manhole on property

☐ Sample Code	P115.	☐ Conductivity, Field, U-MHO	P94.	☐ Chlorine Total Resd mg/l	P50060.
☐ pH, Field S.U.	P400.	☐ Flow, Instantaneous CFS	P61.	☐ Water Temperature, Field	P10.
☐ Dissolved Oxygen, Field mg/l	P300.	☐ Hydrogen Sulfide mg/l	P71875.	☐ Sample Purpose	P71999.
☐ Stream Gage	P65.	☐ Chlorine Free Avl, Field mg/l	P50064.	☐	

☐ Regular (or indicate by checking boxes)		☐ Phosphorus Sol, P mg/l	P666.	☐ Lithium Total, Li ug/l	P1132.
☐ Turbidity FTU	P76.	☐ Phosphate Reactive P mg/l	P70507.	☐ Manganese Total, Mn ug/l	P1055.
☐ Color Pt-Co	P80.	☐ Chloride, Cl mg/l	P940.	☒ Mercury Total, Hg ug/l	P71900. 0.5
☐ Conductivity at 25°C U-MHO	P95.	☐ Fluoride Total, F mg/l	P951.	☐ Molybdenum Total, Mo ug/l	P1062.
☒ pH, Lab S.U.	P403. 7.2	☐ Cyanide,CN mg/l	P720.	☐ Nickel Total, Ni ug/l	P1067.
☐ pH, $CaCO_3$ Stability S.U.	P70311.	☐ Silica, Diss. Si mg/l	P955.	☐ Selenium Total, Se ug/l	P1147.
☐ Alkalinity Total, $CaCO_3$ mg/l	P410.	☐ Calcium Total, Ca mg/l	P916.	☐ Silver Total, Ag ug/l	P1077.
☐ Alkalinity Phth, $CaCO_3$ mg/l	P415.	☐ Magnesium Total, Mg mg/l	P927.	☐ Strontium Total, Sr ug/l	P1082.
☐ Alkalinity $CaCO_3$ Stabl. mg/l	P74023.	☐ Sodium Total, Na mg/l	P929.	☐ Thallium Total, Tl ug/l	P1059.
☐ Acidity Total, $CaCO_3$ mg/l	P70508.	☐ Potassium Total, K mg/l	P937.	☐ Tin Total, Sn ug/l	P1102.
☐ Acidity M.O $CaCO_3$ mg/l	P436.	☐ Aluminum Total, Al ug/l	P1105.	☐ Titanium Total, Ti ug/l	P1152.
☒ Hardness Total, $CaCO_3$ mg/l	P900. 266	☐ Antimony Total, Sb ug/l	P1097.	☐ Vanadium Total, V ug/l	P1087.
☐ Residue, Total mg/l	P500.	☐ Arsenic Total, As ug/l	P1002.	☒ Zinc Total, Zn ug/l	P1092. 30
☐ Residue, Total Volatile mg/l	P505.	☐ Barium Total, Ba ug/l	P1007.	☐ Carbon Total, Organic C mg/l	P680.
☐ Residue, Total Nfilt (Sus) mg/l	P530. 38	☐ Beryllium Total, Be ug/l	P1012.	☐ Carbon Diss, Organic C mg/l	P681.
☐ Residue, Vol, Nfilt mg/l	P535.	☐ Bismuth Total, Bi ug/l	P1017.	☒ Phenol ug/l	P32730. 6
☒ Residue, Total Filt (Diss) mg/l	P70300. 1012	☐ Boron Total, B ug/l	P1022.	☐ MBAS mg/l	P38260.
☐ Residue, Vol Filt mg/l	P520.	☐ Cadmium Total, Cd ug/l	P1027.	☐ Oil-Crease, Total mg/l	P556.
☐ Residue, Settlable ml/l	P545.	☒ Chromium Total, Cr ug/l	P1034. <30	☐ BOD, 5-Day mg/l	P310.
☐ Sulfate, SO_4 mg/l	P945.	☐ Chromium Hex, Cr ug/l	P1032.	☐ COD mg/l	P335.
☐ Nitrogen TKN, N mg/l	P625.	☐ Cobalt Total, Co ug/l	P1037.	☐ TOD mg/l	P343.
☐ Nitrogen Ammonia, N mg/l	P610.	☒ Copper Total, Cu ug/l	P1042. 40	☐	
☐ Nitrate-Nitrite, N mg/l	P620.	☒ Iron Total, Fe ug/l	P1045. 1500	☐	
☐ Nitrite, N mg/l	P615.	☐ Iron Diss., Fe ug/l	P1046.	☐	
☐ Phosphorus Total, P mg/l	P665.	☒ Lead Total, Pb ug/l	P1051. 16	☐	

Distribution: 1—Data Processing 2—Central Office 3—District Office 4—Owner 5—Laboratory

Sodium Plant Effluent

OEPA Designation E312001

TABLE I

Parameter	Unit	4-29-80 24-Hour Composite Lab Sampler	4-29-80 24-Hr. Composite Manhole Sampler	6-24-80	7-29-80	8-7-80
pH	-	8.15	8.00	-	7.40	8.02
Total Residual Chlorine	mg/l	0.03	0.03			
Total Filterable Solids	mg/l	724	890	-	1354	1010
Total Suspended Solids	mg/l	25	38	-	-	13
Conductivity	Micromhos/cm	-			2400	1600
Lead	mg/l	-		0.016	<0.05	<0.05
Mercury	ug/l	-		0.4	0.2	<0.2

Comments: Heavy Rain during night

LSH:hm

9-26-80

Sodium Plant - South Ditch East of Detrex Outfall

OEPA Designation E312002

TABLE II

Parameter	Unit	4-30-80 10:35 A	6-24-80	7-17-80 12:15 P	7-29-80 9 A	8-7-80 3:05 P
pH	-	3.47			3.58	3.18
Total Filterable Solids	mg/l				1586	12,854
Total Suspended Solids	mg/l					9
Conductivity	Micromhos/cm			13,700	2800	17,400
Cadmium	mg/l			0.21	<0.01	0.28
Chromium	mg/l			0.050	0.011	0.063
Copper	mg/l			0.12	0.040	0.077
Iron	mg/l	87		24.	9.0	11
Lead	mg/l		0.37		<0.05	<0.05
Mercury	ug/l		<0.2	<0.2	<0.2	0.2
Nickel	mg/l			0.20	0.049	0.11
Zinc	mg/l		0.33	0.76	0.21	0.34
Phenol	mg/l			<0.003	<0.003	0.005

Comments:

Heavy Rain Previous Night

Sodium Plant - Coal Pile Runoff on RMI Property

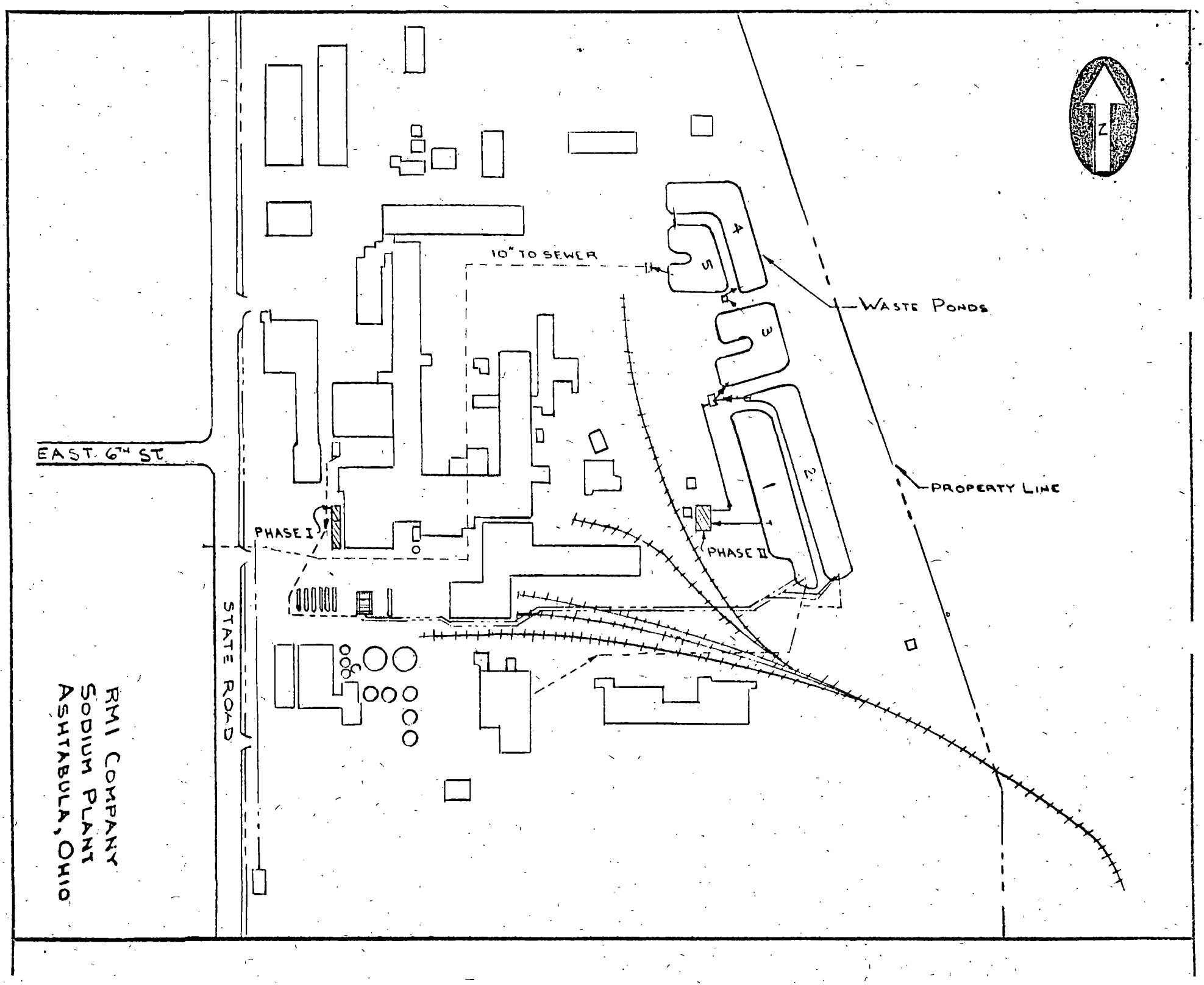
OEPA Designation: Coal Pile Runoff

TABLE III

Parameter	Unit	6-24-80	7-17-80	7-29-80	8-7-80
pH	-			3.37	2.98
Total Filterable Solids	mg/l			402	812
Total Suspended Solids	mg/l				1
Conductivity	Micromhos/cm		2800	820	1500
Cadmium	mg/l		<0.01	<0.01	<0.01
Chromium	mg/l		0.028	0.026	0.036
Copper	mg/l		0.12	0.031	0.050
Iron	mg/l		41.	11.	23.
Lead	mg/l			<0.05	<0.05
Mercury	ug/l	0.2	<0.2	<0.2	<0.2
Nickel	mg/l		0.25	0.034	0.12
Zinc	mg/l		0.76	0.21	0.47
Phenol	mg/l		<0.003	<0.003	0.005

Comments:

Heavy Rain Previous Night


N
10" TO SEWER
WASTE PONDS
PROPERTY LINE
EAST 6TH ST
PHASE I
PHASE II
STATE ROAD
1
2
3
4
5
RMI COMPANY
SODIUM PLANT
ASHTABULA, OHIO

18

RMI TITANIUM

RMI Company

O. BERTEA
GENERAL MANAGER–ASHTABULA OPERATIONS

ASHTABULA PLANTS
P. O. BOX 550
ASHTABULA, OHIO 44004
216/997-5141

May 22, 1981

Mr. William T. Skowronski, P.E.
Group Chief
Industrial Wastewater Division
Ohio Environmental Protection Agency
Northeast District Office
2110 E. Aurora Road
Twinsburg, Ohio 44087

Dear Mr. Skowronski:

Enclosed you will find a copy of the Herron report - Subject: Subsurface Investigation and Groundwater Monitoring - RMI Company Sodium Plant. This report should answer a number of the questions that you posed in our phone conversation last week. We can address other questions which you may have at our June 3, 1981 meeting.

You indicated that you wanted as much of the information as possible prior to our scheduled get-together.

Very truly yours,

RMI COMPANY

O. Bertea

OB:hm

Encls. - Herron Report

SUBSURFACE INVESTIGATION & GROUNDWATER MONITORING

RMI COMPANY

SODIUM PLANT

ASHTABULA, OHIO

F O R

RMI Company

P. O. Box 550

Ashtabula, Ohio 44004

HCI Project No: M-2178.143K

Report Submittal Date: 4 March 1981

HERRON CONSULTANTS, INC.
ENGINEERING • TESTING • INSPECTION

HERRON CONSULTANTS, INC.
ENGINEERING • TESTING • INSPECTION
5555 CANAL ROAD CLEVELAND, OHIO 44125
447-1335

4 March 1981

RMI Company
P. O. Box 550
Ashtabula, Ohio 44004

SUBJECT: SUBSURFACE INVESTIGATION & GROUNDWATER MONITORING
RMI COMPANY
SODIUM PLANT
ASHTABULA, OHIO

HCI Project No: M-2178.143K

This report summarizes the results of a study conducted at the request of Mr. George Hakkio, Chief Engineer - Ashtabula Plants. The investigated site is Sodium Plant of RMI Company in Ashtabula, Ohio.

The study was authorized per Purchase Order No. 3-68175, dated 7 December 1980. It was intended to determine the following:

(a) stratigraphic sequence of various geophysical formations within certain sectors of Sodium Plant of RMI Company in Ashtabula,

(b) nature and level of chemical contaminants within the investigated area's groundwater, and

(c) direction of groundwater flow and flow gradient.

SITE CONDITIONS

The investigated site measures approximately 700' x 700' in plan dimensions. It is located about 500' east of westerly property limits along State Road and 70' north of south property line. Approximately 100' east of north-east property limits there exist currently coal piles

belonging to Cleveland Electric Illuminating Company. Areas north and northwest of the investigated site are occupied by a system of railroad tracks, and RMI office buildings and manufacturing plant complex respectively. There also exists two ponds - one immediately to the southeast and the other approximately 350' west of the westerly limits of the investigated site. Another pond exists exterior to and in the vicinity of northwest corner of the subject site. An unpaved road, about twenty (20) feet wide, bounds those RMI sectors included under this investigation.

Surface water flowing from the CEI coal piles enters RMI at about mid-point of easterly limits of the investigated site and leaves the subject area at its approximate southwest corner.

A submitted drawing showing general layout and surface topography of RMI Sodium Plant in Ashtabula, Ohio, date of photography 11-16-79, date of mapping, December, 1979, project no. 178, indicates the surface elevations to range between minimums of about 635' along the unpaved peripheral road and maximums of over 645' in the vicinity of southeast investigated site sectors.

Further, during our site meeting with Mr. Hakkio on 25 November, 1980, we were informed that deposition of the miscellaneous fill materials was limited to approximately westerly half and southeast sections of the investigated site.

INVESTIGATION PROGRAM

At the time this study was undertaken in early December, 1980, it was proposed that three (3) monitoring wells should be installed within those site areas where fill materials had been deposited in the past. In connection with each of the monitoring wells, four observation holes were proposed to determine groundwater flow direction and flow gradient. It was also proposed that two additional solo observation holes, one each at where the surface water from CEI site enters and leaves the investigated RMI areas, be installed. At a later date, fourth monitoring well and associated four (4) observations holes were requested by Mr. Hakkio. Only

water samples taken from the four (4) monitoring wells and two (2) solo observation wells were proposed to be subjected to chemical analysis. Approximate locations of the individual monitoring and observation wells are shown on the accompanying Plot Plan which has been taken directly from the referenced document.

Overall field and laboratory program has involved the following:

Soil and Water Sampling Operations, and Laboratory Test Studies

At each of the monitoring and observation well locations, test holes were advanced by rotary drive drilling procedures, employing 7.0 inch o.d. by 3.25 inch i.d. hollow stem continuous flight augers.

Variations of soil and groundwater conditions encountered during the boring operations were noted only at the monitoring well locations. This was accomplished by taking representative samples of the existing subsoil at intervals by means of a two-inch o.d. split spoon sampling device, driven by a 140 pound hammer, free falling through a distance of thirty (30) inches. During the course of sampling operations, the number of hammer blows required to achieve eighteen (18) inches of sample spoon penetration, including an initial six-inch penetration, was noted and is recorded in six-inch increments under "Blow Counts" on the accompanying Test Boring Logs. The sum of the blow counts associated with the second and third six-inch penetration intervals is customarily termed "standard penetration resistance" (N).

The samples of materials obtained as a result of drive sampling operations were removed from the sampler, visually classified and placed in properly identified sealed glass sample jars. The subsoil material samples were then removed to our Cleveland soil mechanics laboratory for evalaution.

In addition to the soil samples, one (1) water sample from each of the monitoring wells and observations wells P-1 and P-2 were procured subsequent to their installation, details of which are given in the next section. The samples were brought to our Cleveland Chemistry laboratory for chemical analysis. The soil and water samples, were subjected to the following laboratory tests:

(a) The subsoil materials were reclassified in substantial accordance with the requirements of the American Society for Testing and Materials' method designation D 2488, "Description of Soils (Visual-Manual Procedures)" and identified employing the nomenclature of the Unified Soil Classification System (ASTM D 2487).

The results of visual-manual classification operations, together with certain pertinent data developed during field exploration operations, are included on the accompanying Test Boring Logs.

(b) Water samples were subjected to chemical analysis for determination of the following:

Arsenic
Barium
Cadmium
Chromium
Lead
Mercury
Selenium
Silver
Xylene Water
Volatile at 105°F
Volatile at 540°F
Chemical Oxygen Demand
pH
Conductivity

Installation of Monitoring and Observation Wells

Each observation well primarily consisted of about fifteen (15) feet long, two-inch diameter perforated PVC pipe. The pipe was installed immediately following drilling the hole with 7.0-inch o.d. hollow stem continuous flight auger.

Monitoring well consisted of about twenty-five (25) foot long 6-inch diameter flush joint schedule 80 PVC casing with five (5) foot long no. 60 slot PVC well screen at the bottom.. Because of the difficulty in keeping the test holes open subsequent to removal of 7.0 inch o.d. flight augers, at each monitoring well location holes were redrilled with 12-inch o.d. solid stem auger immediately prior to well installation. Sand was poured in the annular space between the PVC pipe and the surrounding soil for full depth minus between about two (2) and three (3) feet. Each well was then completed by filling the remaining annular space with bentonite balls. Each well extended by between about two (2) and four (4) feet above the surrounding site grade. Each monitoring well casing was protected by an 8-inch diameter and about five (5) foot long protective iron pipe with lockable cover.

Typical details of the monitoring and observations are shown in Plates 1 and 2 respectively.

RESULTS

(a) Subsurface Profile

Results of the field drilling operations indicate the site areas to be overlain by fill materials consisting of sand, clay, brick, and/or concrete, and/or cinder and occasional chemical odor. Following thicknesses of the fill materials were indicated at the monitoring well locations from where soil samples were taken:

Test Position	Fill Thickness, ft.
M-1	5.0±
M-2	9.5±
M-3	9.0±
M-4	-

Inferior to surface grades and/or the fill materials, area's predominant subsurface formation consists of brown and/or gray silty clay with occasional lenses/layers of sand and silt. Cohesive materials exhibit medium to hard structural states and moist to wet consistencies. At positions M-1 and M-3, silty clay was found to be intersticed with medium to dense and wet layers of gray silt. Silt layers ranged in thickness of between about 1.5 and three (3) feet, and were encountered at varying depths. Subsurface materials at M-1 and M-2 exhibited strong chemical odor through full depth of field exploratory operations.

During the course of field exploratory operations, the following water depths were indicated.

Test Location	Water Depth, ft. Encounter	Completion
M-1	4.0	-
	21.5	
M-2	12.0	-
	27.0	
M-3	16.0	-
M-4	27.0	26.0
	23.0 (Seepage)	12.4 (4-hours)

(b) Chemical Evaluation

Results of the laboratory chemical analysis and the maximum concentrations recommended by U.S. Environmental Protection Agency (Reference: FEDERAL REGISTER, Vol. 45, No. 98, May 19, 1980, Rules and Regulations), wherever applicable, are given in the accompanying Table No. 1. Report by Crobaugh Division of Herron Testing Laboratories, Inc. where the chemical tests were performed, is also included in the Appendix to this submittal.

The table shows that at the subject site, the level of heavy metal contaminants is far below the upper limits recommended by U.S., EPA.

(c) Groundwater Monitoring

The following two (2) methods have been employed to determine direction of the groundwater flow and the flow gradient.

Graphical

This involves establishment/determination of

(i) location of the individual monitoring and observation wells,

(ii) elevation of the ground at the monitoring and observation well locations, and

(iii) groundwater table elevations

Summary of the ground and the groundwater elevations is included in the accompanying Table No. 2.

Using the data of Table No. 2, direction of groundwater flow and the flow gradient were determined for three different cases. The method utilizes one upgradient and two down gradient water wells, and is illustrated in Plates #3, #4 and #5. The three cases investigated resulted in the following groundwater flow directions and flow gradients.

Plate Number	Groundwater Flow Direction	Flow Gradient
3	Towards S 32.5° W	0.026
4	Towards N 17° W	0.0133
5	Towards S 17° W	0.0117

NOTE: "North" has been assumed to be parallel to State Road.

It must be recognized that groundwater flow direction is significantly influenced by the local topography of the area. It is evident from the results, tabulated above, that groundwater has the tendency to flow generally towards the existing creek which crosses the investigated site immediately west of M-4 in the north-south direction, south of M-2 and north of M-1 in the east-west direction, and leaves the site in the vicinity of P-2. The influence of local surface topography and drainage pattern on the preferential direction of groundwater flow is exemplified in Plates #3, #4 and #5. For instance, in Plate #4 which involves wells M-1, M-2 and P-2, located on either side of east-west section of the creek and in the vicinity of southerly property limits, flow is indicated towards northwest direction; while in Plate #3 representing wells M-1, M-2, M-3 located on either of north-south section of creek, groundwater flow was found to be towards south-west direction. Such variations in the flow direction can and will occur where sudden alterations in either the surface topography and/or the drainage pattern are either introduced or exist.

Dye Injection

To supplement the information gathered from graphical representation relative to groundwater flow direction, dye was introduced in monitoring wells M-1, M-2 and M-3 on 11 March, 1981. The intention being that appearance of this dye in any of the surrounding observation wells will reflect the general directions of groundwater flow. Field visit was made on 17 March 1981 to observe if in fact dye had traversed to any of the observation wells. No dye was detected. This in our opinion is due to very low permeability of the area's silty clay soils. With the known permeabilities of silty clay formation to range between 10^{-5} and 10^{-7} cm/sec., it could take extended time period before dye will be seen in any of the observation wells surrounding a particular monitoring well unless of course, the water is forced to flow under pressure. This process will require extensive preparation and time involvement in the field.

We thank you for the opportunity to work on this project and look forward to working with you in the future. In the meantime, if you have any questions, please do not hesitate to contact us.

HERRON CONSULTANTS, INC.

Vijay K. Khosla, Ph.D., P. E.
Director of Engineering

VKK/lk

3cc: The RMI Company

TABLE 1

SUMMARY OF LABORATORY CHEMICAL ANALYSIS

Factor		Laboratory Test Data M-1	M-2	M-3	M-4	P-1	P-2	U.S. EPA Recommended Maximum Concentration
Arsenic,	ppm	0.056	0.017	0.001	0.027	0.003	0.005	5.0
Barium,	ppm	5.0	0.18	0.24	0.09	0.5	0.92	100.0
Cadmium,	ppm	0.44	<0.02	<0.02	<0.02	<0.02	<0.02	1.0
Chromium,	ppm	0.08	0.01	<0.01	<0.01	<0.10	0.05	5.0
Lead,	ppm	<0.20	0.04	<0.02	<0.02	<0.20	<0.08	5.2
Mercury,	ppm	0.0002	0.0002	<0.0001	0.0007	<0.0001	0.0001	0.2
Selenium,	ppm	0.001	0.004	<0.001	<0.001	<0.001	<0.001	1.0
Silver,	ppm	0.017	0.09	<0.02	<0.02	0.03	0.03	5.0
Xylane Water,		91	90	95	90	95	95	-
Volatile at 105°F, %		98.9	99.6	99.7	99.9	98.6	93	-
Volatile at 540°F, %		92.4	72.0	84.2	90.4	69.6	79.6	-
Chemical Oxygen Demand		604	208	306	68	420	127	-
pH		5.9	7.6	7.1	7.6	7.2	7.1	-
Conductivity Mohs/Cm. at 25°C		79002	6105	4429	1388	15800	12808	-

HERRON CONSULTANTS, INC.
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T A B L E 2

SUMMARY OF STATION AND GROUNDWATER ELEVATIONS

Station Number	Station Elevation, MSL Ground	Pipe	Water Elevation MSL 1-31-1981	2-26-1981	3-11-1981*
M-1	636.60	639.17	633.60	634.3	633.6
E01	636.80	638.93			
W01	636.70	640.46			
N01	637.50	641.72			
S01	636.20	638.65			
M-2	637.20	639.35	631.20	631.1	630.6
E02	638.10	640.36			
W02	636.40	638.91			
N02	637.50	641.19			
S02	636.80	639.28			
M-3	641.20	643.03	636.20	636.9	637.1
E03	641.00	643.35			
W03	640.00	642.59			
N03	640.60	642.67			
S03	641.00	642.89			
M-4	637.80	641.56	636.30	636.4	635.7
E04	637.00	639.46			
W04	638.00	640.29			
N04	637.50	639.67			
S04	637.10	639.37			
P-1	634.50	636.21	632.5	632.9	632.5
P-2	632.70	636.19	629.2	630.4	631.7

(*) Represents stable groundwater condition since no significant rainfall occurred between 2-26-1981 and 3-11-1981.

HERRON TESTING LABORATORIES, INC.
CROBAUGH DIVISION
INORGANIC AND ORGANIC ANALYSIS
5405 E. SCHAAF RD.
CLEVELAND, OH 44131
(216) 524-1450

Purchase Order No. M 2178
File No. C 4555
February 27, 1981

Analysis of Six (6) Water Samples
Marked Please see below

Client The R.M.I. Company
P.O. Box 550
Ashtabula, Ohio 44004

Received on 2-3-81

CHEMICAL ANALYSIS

Customer I.D.	P1	P2	M1	M2	M3	M4
HTL I.D.	C 4555-1	C 4555-2	C 4555-3	C 4555-4	C 4555-5	C 4555-6
HCI I.D.	1	2	3	4	5	6
Arsenic	0.003	0.005	0.056	0.017	0.001	0.027
Barium	0.50	0.92	5.0	0.18	0.24	0.09
Cadmium	<0.02	<0.02	0.44	<0.02	<0.02	<0.02
Chromium	<0.10	0.05	0.08	0.01	<0.01	<0.01
Lead	<0.20	<0.08	<0.20	0.04	<0.02	<0.02
Mercury	<0.0001	0.0001	0.0002	0.0002	<0.0001	0.0007
Selenium	<0.001	<0.001	0.001	0.004	<0.001	<0.001
Silver	0.03	0.03	0.17	0.05	<0.02	<0.02
(Xylene) H_2O	95%	95%	91%	90%	95%	90%
Volatiles 105°C.	98.6%	93.0%	98.9%	99.6%	99.7%	99.9%
Volatiles 540°C.	69.6%	79.6%	92.4%	72.0%	84.2%	90.4%
COD	420	127	604	208	306	68
pH	7.2	7.1	5.9	7.6	7.1	7.6
Conductivity-umhos/cm @ 25°C.	15800	12808	79002	6105	4429	1388

The above results are in mg/l unless otherwise specified.

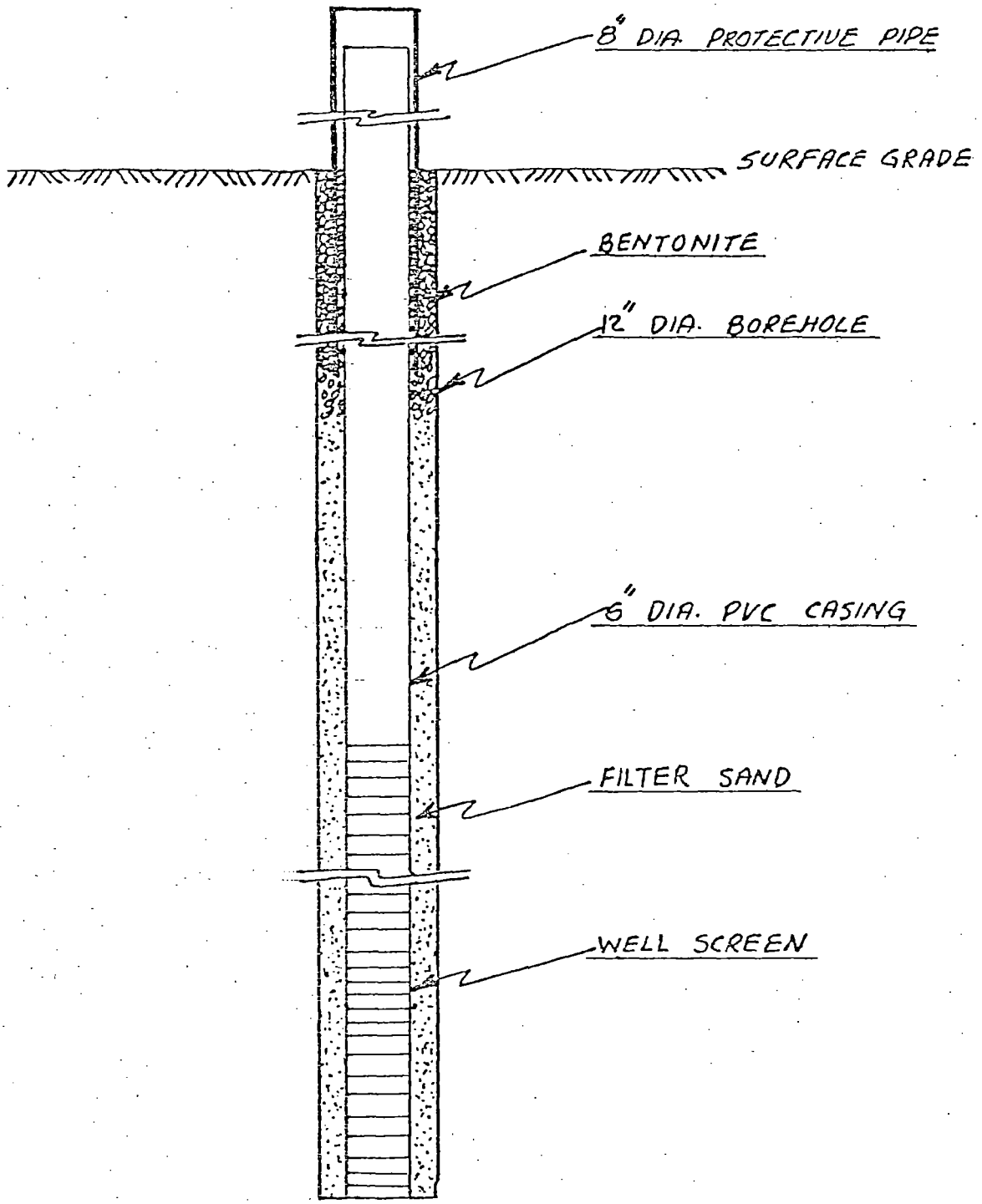
The water content by xylene distillation is an empirical value utilized to give an estmiation of the possibilty of low boiling point volatile organics.

Respectfully submitted,

CROBAUGH DIVISION
HERRON TESTING LABORATORIES, INC.

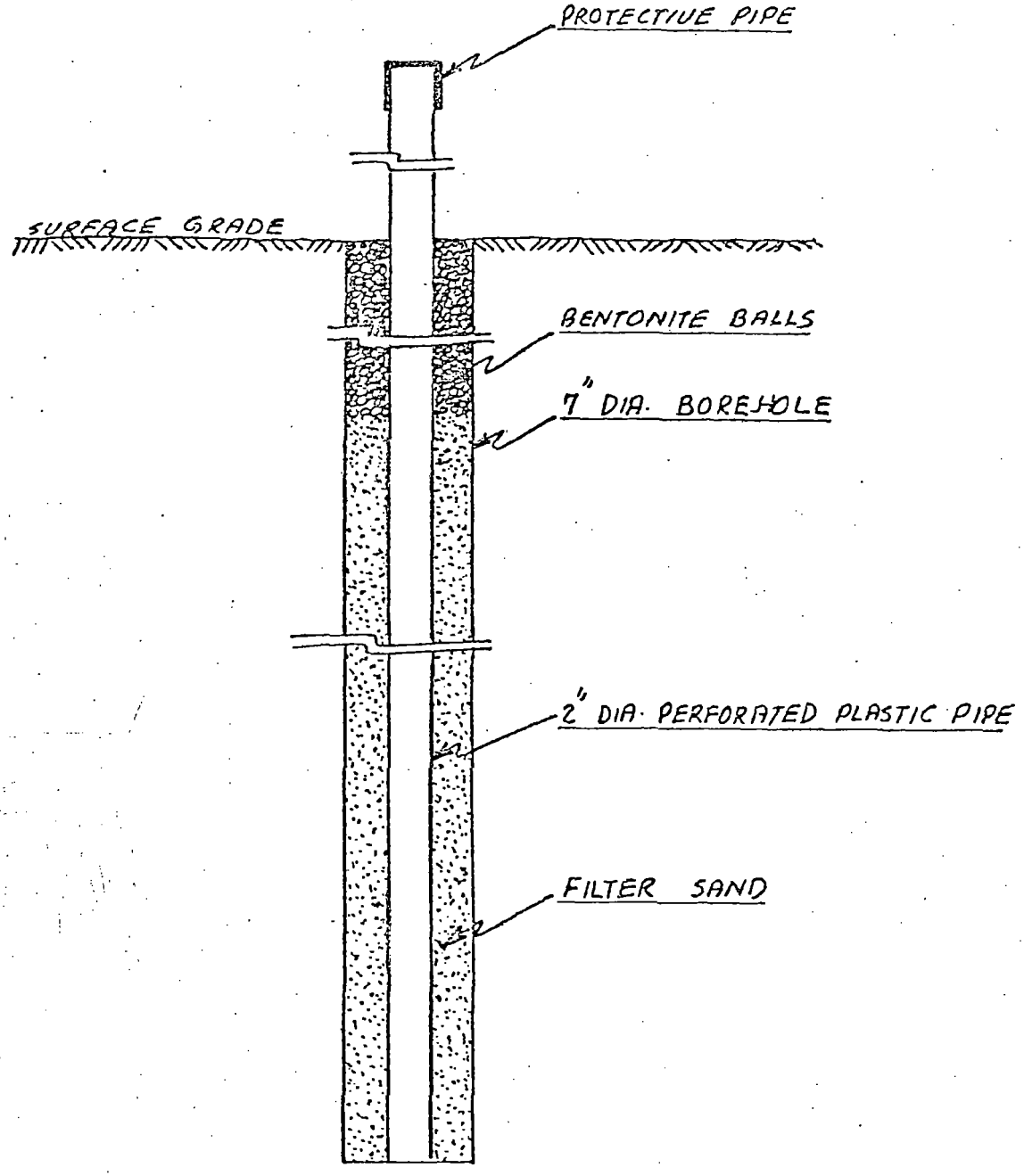
Robert Haddad
Technical Administrator

ljc



SCHEMATIC MONITORING WELL

PLATE NO. 1



SCHEMATIC OBSERVATION WELL

PLATE NO. 2

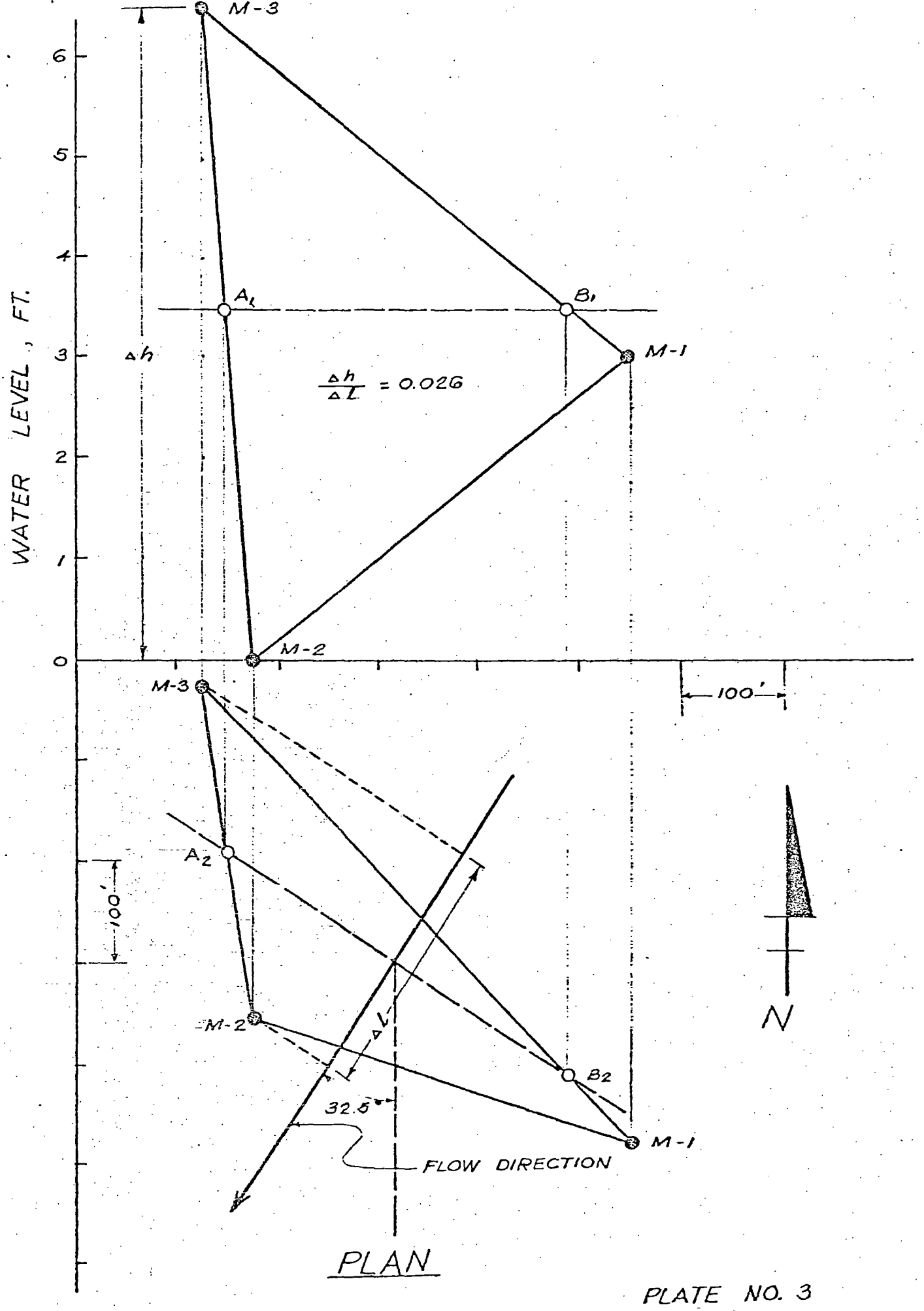
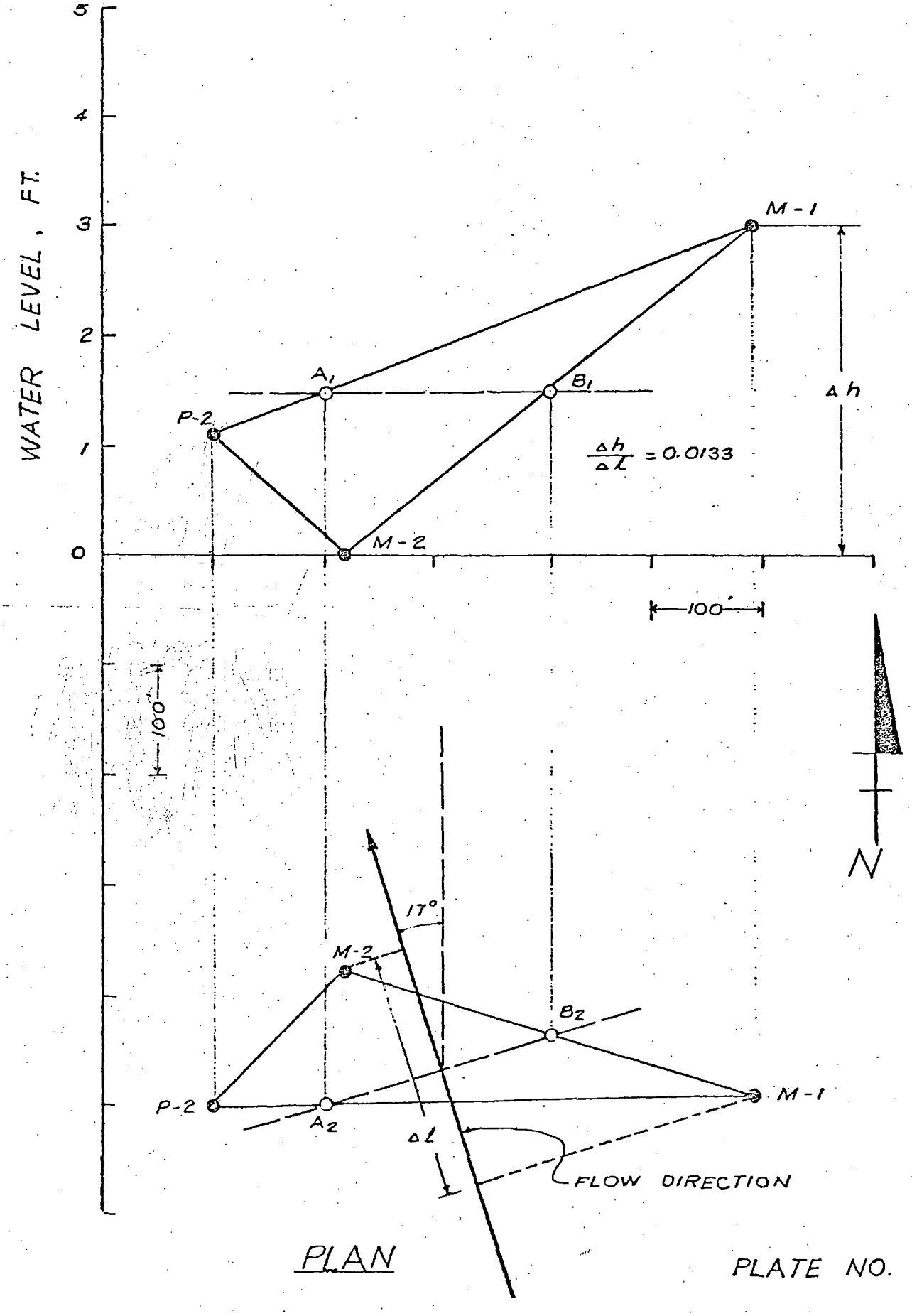

WATER LEVEL, FT.
6
5
4
3
2
1
0
M-3
A1
B1
M-1
Δh
Δh/Δl = 0.026
M-2
100'
M-3
A2
100'
M-2
ΔL
B2
32.5°
M-1
FLOW DIRECTION
N
PLAN

PLATE NO. 3



PLAN

PLATE NO. 4

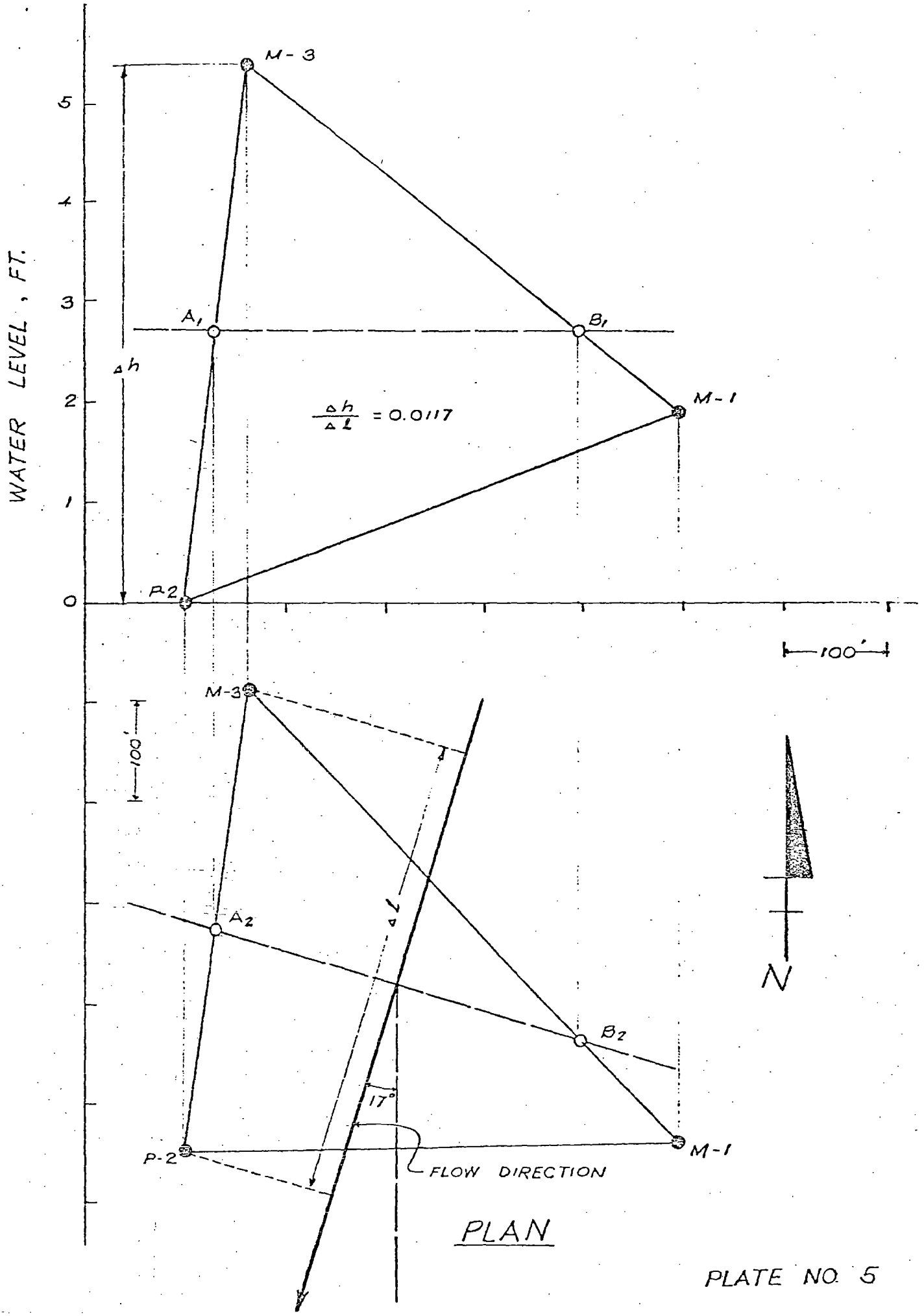

WATER LEVEL, FT.
0
1
2
3
4
5
M-3
A1
B1
M-1
P-2
Δh
Δh/ΔL = 0.0117
100'
M-3
100'
A2
B2
M-1
P-2
ΔL
17°
FLOW DIRECTION
N
PLAN

PLATE NO. 5

A P P E N D I X

TEST BORING LOG

TEST HOLE M-1

FILE NO.: M-2178.143K

PROJECT: POND AREA - SODIUM PLANT - STATE ROAD - ASHTABULA, OHIO

FOR: THE RMI COMPANY - ASHTABULA, OHIO

ELEV. DATUM: _____ DRILLED: DECEMBER 23, 1980 BY T. LATOS

ELEV. (FT.)	DEPTH (FT.)	LOG	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT	CLASSIFICATION
	0		1	SS	73-24-24	Miscellaneous Fill consisting of Sand and Crushed Concrete. Dense. Moist.
			2	SS	30/6"	
			3	SS	3-3-2	Brown COARSE AND MEDIUM SAND. Fill. Loose. Wet. (SP)
	5		4	SS	4-4-6	Brown and Gray Mottled SILTY CLAY. Chemical Odor noted. Stiff. Moist. (CL)
			5	SS	4-5-5	
			6	SS	5-7-8	Brown and Gray Layers of SILT and SILTY CLAY. Chemical Odor noted. Stiff. Wet. (ML) and (CL)
	10		7	SS	8-8-7	
			8	SS	6-9-14	Brown SILTY CLAY. Trace Sand. Some Silt Layers in formation. Chemical Odor noted. Stiff to Very Stiff. Moist. (CL)
			9	SS	9-13-14	
			10	SS	10-13-12	
	15		11	SS	11-14-16	
			12	SS	12-12-14	
			13	SS	12-16-20	Gray SILTY CLAY. Some Silt Layers in formation. Chemical Odor noted. Hard. Moist. (CL)
	20		14	SS	13-17-19	Gray SILT. Some Clay. Chemical Odor noted. Dense. Wet. (ML)
			15	SS	11-5-6	Gray SILTY CLAY. Some Silt Layers in formation. Chemical Odor noted. Stiff. Moist. (CL)
			16	SS	4-5-7	
	25					

GROUNDWATER: ENCOUNTER: 4.0' & 21.5'

AT COMPLETION: _____

AFTER _____ AT _____

TERMINAL DEPTH: 24.0'

HERRON CONSULTANTS, INC.
ENGINEERING · TESTING · INSPECTION

TEST BORING LOG

TEST HOLE M-2

FILE NO.: M-2178.143K

PROJECT: POND AREA - SODIUM PLANT - STATE ROAD - ASHTABULA, OHIO

FOR: THE RMI COMPANY - ASHTABULA, OHIO

ELEV. DATUM: DRILLED: JANUARY 9, 1981 BY T. LATOS

ELEV. (FT.)	DEPTH (FT.)	LOG	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT	CLASSIFICATION
	0					0 - 2.0' Sand, Clay and Brick. Fill. Frozen.
			1	SS	8-10-10	Brown and Gray SILTY CLAY. Some Sand. Trace Gravel. Chemical Odor noted. Fill. Very Stiff to Stiff. Moist. (CL)
			2	SS	6-8-9	
	5		3	SS	4-6-8	
			4	SS	5-5-9	Layers of Cinders and Brown Silty Clay. Chemical Odor noted. Fill. Stiff. Moist.
			5	SS	5-6-7	
	10		6	SS	6-6-6	Brown SILTY CLAY. Chemical Odor noted. Stiff to Very Stiff. Moist. (CL)
			7	SS	6-7-6	
			8	SS	5-7-8	
	15		9	SS	7-14-17	
			10	SS	12-15-19	
			11	SS	5-7-9	Gray SILTY CLAY. Layers of Silt throughout formation. Chemical Odor noted. Stiff to Very Stiff. Moist. Wet at 26.0'. (CL)
	20		12	SS	6-6-8	
			13	SS	5-6-4	
			14	SS	4-6-9	
			15	SS	4-4-3	
	25		16	SS	5-7-7	
			17	SS	6-7-8	
			18	SS	5-8-8	
	30		19	SS	6-6-9	
	35					

GROUNDWATER: ENCOUNTER: 12.0' & 27.0'

AT COMPLETION:

AFTER AT

TERMINAL DEPTH: 30.5'

HERRON CONSULTANTS, INC.
ENGINEERING - TESTING - INSPECTION

TEST BORING LOG

TEST HOLE M-3

FILE NO.: M-2178 143K

PROJECT: POND AREA - SODIUM PLANT - STATE ROAD - ASHTABULA, OHIO

FOR: THE RMI COMPANY - ASHTABULA, OHIO

ELEV. DATUM: DRILLED: DECEMBER 18, 1980 BY T. LATOS

ELEV. (FT.)	DEPTH (FT.)	LOG	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT	CLASSIFICATION
	0		1	SS	6-7-8	Mixture of Brown Silty Clay and Cinders. Fill. Stiff. Moist.
			2	SS	5-4-7	Brown CLAYEY SAND, Silty. Trace Gravel. Fill. Medium. Moist. (SC)
			3	SS	7-5-4	
	5		4	SS	5-4-5	Layers of Cinders and Brown Silty Clay. Fill. Stiff to Soft. Moist.
			5	SS	2-2-2	
			6	SS	2-4-5	
			7	SS	9-12-14	
	10		8	SS	12-14-17	Brown SILTY CLAY. Trace Sand. Very Stiff to Hard. Moist. (CL)
			9	SS	11-14-11	
			10	SS	7-14-14	
	15		11	SS	7-7-8	Gray SILT. Some Clay. Medium. Wet. (ML)
			12	SS	8-8-8	
			13	SS	7-10-11	
	20		14	SS	6-7-9	Gray SILTY CLAY. Some Silt Layers noted in formation. Very Stiff. Moist. (CL)
			15	SS	8-9-11	
			16	SS	7-10-14	
	25					

GROUNDWATER: ENCOUNTER: 16.0'

AT COMPLETION:

AFTER AT

TERMINAL DEPTH: 24.0'

HERRON CONSULTANTS, INC.
ENGINEERING · TESTING · INSPECTION

TEST BORING LOG

TEST HOLE M-4

FILE NO.: M-2178.143K

PROJECT: POND AREA - SODIUM PLANT - STATE ROAD - ASHTABULA, OHIO

FOR: THE RMI COMPANY - ASHTABULA, OHIO

ELEV. DATUM: DRILLED: JANUARY 20, 1981 BY T. LATOS

ELEV. (FT.)	DEPTH (FT.)	LOG	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT	CLASSIFICATION
	0					
			1	SS	4-4-5	Brown SILTY CLAY. Sand Lenses. Medium to Stiff. Moist. (CL)
	5		2	SS	5-6-8	
			3	SS	5-7-11	
	10		4	SS	8-9-14	Brown and Gray SILTY CLAY. Stiff. Moist. (CL)
	15		5	SS	5-7-8	Gray SILTY CLAY. Medium Stiff. Moist. (CL)
	20		6	SS	4-5-7	
	25		7	SS	12-15-16	Gray SILTY CLAY. Stiff. Moist to Wet. (CL)
	30		8	SS	6-7-9	Gray SILTY CLAY. Stiff. Moist to Wet. (CL)

GROUNDWATER:
ENCOUNTER: 27.0'-SEEPAGE @ 23.0'
AT COMPLETION: 26.0'
AFTER 4 HOURS AT 12.7'
TERMINAL DEPTH: 30.0'

HERRON CONSULTANTS, INC.
ENGINEERING • TESTING • INSPECTION

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			GROUP SYMBOL	GRAPHIC SYMBOL	TYPICAL NAME
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS	GW		WELL GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
			GP		POORLY-GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES	GM		SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
			GC		CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SAND AND SANDY SOILS	CLEAN SAND	SW		WELL-GRADED SANDS OR GRAVELLY SANDS, LITTLE OR NO FINES
			SP		POORLY GRADED SANDS OR GRAVELLY SANDS, LITTLE OR NO FINES
		SAND WITH FINES	SM		SILTY SANDS, SAND-SILT MIXTURES
			SC		CLAYEY SANDS, SAND-SILT MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS LL<50		ML		INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL		INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL		ORGANIC SILTS AND ORGANIC SILT-CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LL>50		MH		INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SOILS
			CH		INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAY
			OH		ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			Pt		PEAT AND OTHER HIGHLY ORGANIC SOILS

BOULDERS — COARSER THAN 6 INCHES

COBBLES — 3 INCHES TO 6 INCHES

GRAVEL

COARSE — .75 INCHES TO 3 INCHES

FINE — 4.76 MM. TO .75 INCHES

SAND

COARSE — 2.00 MM. TO 4.76 MM.

MEDIUM — .42 MM. TO 2.00 MM.

FINE — .074 MM. TO .42 MM.

SILT — .005 MM. TO .074 MM.

CLAY — FINER THAN .005 MM.

PER ASTM D 2487

HERRON CONSULTANTS, INC.

ENGINEERING • TESTING • INSPECTION

GENERAL NOTES FOR TEST BORING LOGS

ENTERED UNDER **SAMPLE TYPE:**

CA — Continuous Flight Auger Sample
HA — Hand Auger Sample

Disturbed sample obtained from auger flight.

SS — Split Barrel Sample (2" O.D., 1.375" I.D.)*

Driven sampler for disturbed sample.

ST-2 — Thin-Walled Shelby Tube Sample (2" O.D., 1.875" I.D.)
ST-3 — Thin-Walled Shelby Tube Sample (3" O.D., 2.875" I.D.)
PT — Thin-Walled Piston Tube Sample

Static force pressed sampler for "undisturbed" sample.

LS — Sectional Liner Sample (Ring Shear)

W — Wash Sample

Obtained from churn-drive boring methods.

DC — Diamond Rock Core Barrel Sample (unspecified size)
NX — 2.125" I.D. Diamond Rock Core Barrel Sample
BX — 1.625" I.D. Diamond Rock Core Barrel Sample
AX — 1.1875" I.D. Diamond Rock Core Barrel Sample

ENTERED UNDER **SAMPLE NO.:**

[2] — Indicates sample number and acquisition interval.

ENTERED UNDER **BLOW COUNT:**

EXAMPLE: 6/9/12 — The number of blows of a 140-pound hammer, free falling through a distance of 30 inches, required to drive a standard (2" O.D., 1.375" I.D.) split barrel sampler into the soil, including an initial six-inch seating penetration. Blows recorded in 6-inch increments for a distance of 18 inches.

EXAMPLE: 60/2" — The number of blows (60) required to drive a standard split barrel sampler for a distance (2") of less than one foot.

SSR — Split barrel sampler penetration refusal at advance of less than one inch for 50 blows.

AR — Auger refusal.

(*) Other diameters, when employed, are noted on Boring Log.

Case No. 78-1381-WW-AAC

Appendix A

SERVICE AREA DESCRIPTION
OHIO-AMERICAN WATER COMPANY
AMENDED CERTIFICATE OF PUBLIC CONVENIENCE & NECESSITY NO. 12

Situated in the County of Ashtabula, State of Ohio, and bounded and described as commencing in the northeast corner of the territory now served, beginning at the North Kingsville and Conneaut, Ohio, corporation line on the shores of Lake Erie and running in a southerly direction to Gore Road in North Kingsville, then in easterly direction on the north side of Gore Road to a point some 900 feet; then southerly to the south side of Gore Road and then westerly the same distance to the said corporation line; thence in a southerly direction, following the corporation line of North Kingsville and that of Conneaut, Ohio to the north banks of the Ashtabula River. Thence westerly, following the north banks of the Ashtabula River to the confluence with Hubbard Run, thence following the bank of Hubbard Run in a southerly direction to the Austinburg Road; thence in a southerly direction to the power line right-of-way of The Cleveland Electric Illuminating Company, thence in a westerly direction along said right-of-way to a point some 300 feet east of S.R. 45, thence in a northerly direction to The Cleveland Electric Illuminating Company's northern right-of-way; thence east to Gerald Road, thence in a northerly direction to Carpenter Road and Crofoot Road intersection; thence north along the centerline of Crofoot Road to a point even with the rear lot lines of lots located on the north side of Carpenter Road; thence east along the rear lot lines of lots located on the north side of Carpenter Road to a point perpendicular with the rear lot lines of lots located on the east side of Winterhaven Road; thence north along said perpendicular line and the rear lot lines of lots located on the east side of Winterhaven Road to the south right-of-way line of Glen Arden Road; thenc east along the south right-of-way line of Glen Arden Road to a point perpendicular with the rear lot lines of lots facing the east side of West Minister Avenue; thence north along said perpendicular line and the rear lot lines of lots facing the east side of West Minister Avenue to the northeast property pin of L. E. Adams; thence easterly along the City Limits line of Lake Road (S.R. 531) to the center line of Lake Road (S.R. 531) to a point perpendicular with the southwest corner of the Mercurio Rental Incorporated Property; thence in a northwesterly direction to the southwest corner of the Mercurio Rental Incorporated Property; thence in a northwesterly direction along the western property line of Mercurio Rental Incorporated Property to the shore line of Lake Erie; and then following the shores of Lake Erie in an easterly direction to the point of beginning.

Approximate figures.

DATA:

4 mile = 35,979 persons.
3 mile Radius = 30,281 persons
2 mile " = 12,112 persons
1 mile " = 3,028 persons

Calculations:

3 mile: Ashtabula Twp = 25,829 persons
+ 7,220 persons = house count (outside Twp. inside 3-mile
− 2,768 " = " " (inside Twp outside 3-mile)
(30,281) persons

2 mile

2 mile population is 4/10 of 30,281 = (12,112) persons

1 mile population is 1/4 the size of 12,112 persons. =
(3028 persons)

4 mile

30,281
+ 2 768 persons (inside Twp. outside 3mile)
+ 2930 persons (House count)
(35,979 person)

771 homes = 2930 persons

Ohio Congressional Districts

Anthony J. Celebrezze, Jr.
Secretary of State

TWENTY-SECOND DECENNIAL CENSUS
1981

TY

Legislature. The County was named after
cky. Ashland City had a population of 1,264

970	1960	1950	1940
3,303	38,771	33,040	29,785
,639	1,360	1,165	988
394	....	....	....
361	409	407	358
3,368	2,993	2,777	2,541
2,865	2,611	2,523	2,334
2,865	2,611	2,523	2,334
1,184	964	941	879
1,681	1,647	1,582	1,455
....	....	....	....
752	769	674	728
2,438	2,347	2,221	2,196
1,410	1,352	1,273	1,074
435	358	332	275
501	534	475	494
932	739	558	492
215	216	186	161
1,919	1,633	1,267	1,019
1,561	1,467	1,333	1,300
559	540	513	474
2,198	2,139	16,028	13,923
....	....	14,287	12,453
1,843	1,708	1,349	1,348
1,356	1,156	965	987
666	649	603	542
1,063	968	943	863
749	707	687	657
9,872	17,419	....	....
9,872	17,419	....	....
1,788	1,600	1,396	1,361
506	435	381	363

ch was established July, 1956; returned in

TABLE 2—POPULATION OF COUNTIES BY MINOR CIVIL DIVISIONS:
1980, 1970, 1960, 1950, and 1940—Continued

ASHTABULA COUNTY

Ashtabula County was erected in 1807 by an act of the Legislature. The County was named after the Ashtabula River; Ashtabula is an Indian name meaning "fish river".

County and Minor Civil Divisions	1980	1970	1960	1950	1940
Ashtabula County	**104,215**	**98,237**	**93,067**	**78,695**	**68,674**
Andover township	2,424	2,142	1,853	1,761	1,554
Andover village	1,205	1,179	1,116	1,102	945
Ashtabula township	25,829	27,007	27,904	26,508	23,230
Ashtabula city, total	23,449	24,313	24,559	23,696	21,405
In Ashtabula township	18,521	19,615	20,836	22,019	20,193
In Saybrook township	4,928	4,698	3,723	1,677	1,212
East Ashtabula (unincorporated) (1)	....	....	4,179	2,390	....
Edgewood (unincorporated) (2)	3,099	3,437	....	....	....
Austinburg township	1,869	1,487	1,406	951	1,016
Cherry Valley township	765	631	583	574	532
Colebrook township	731	731	712	719	750
Conneaut township	13,835	14,552	10,557	10,230	12,328
Conneaut city	13,835	14,552	10,557	10,230	9,355
Denmark township	818	773	769	643	666
Dorset township	952	886	915	824	793
Geneva township	12,017	11,099	9,466	7,268	6,031
Geneva city	6,655	6,449	5,677	4,718	4,171
Geneva-on-the-Lake village	1,634	877	631	388	172
Harpersfield township	2,331	1,584	1,414	1,111	950
Hartsgrove township	1,214	903	880	781	592
Jefferson township	4,987	4,140	3,773	3,079	2,722
Jefferson village	2,952	2,472	2,116	1,844	1,676
Kingsville township	2,162	4,181	3,706	2,640	2,064
Kingsville (unincorporated) (3)	1,243	1,129	....	....	....
North Kingsville village (4)	....	2,458	1,854	1,271	834
Lakeville township (5)	....	....	4,181	3,432	....
Lakeville village (5)	....	....	4,181	3,432	....
Lenox township	1,291	1,182	998	764	714
Monroe township	2,079	1,712	1,552	1,250	991
Morgan township	1,359	1,501	1,355	1,090	1,020
Roaming Shores village, total (6)	581	....	....	....	....
In Morgan township	294	....	....	....	....
In Rome township	287	....	....	....	....
Rock Creek village	652	731	679	604	492
New Lyme township	1,058	873	847	808	729
North Kingsville township (4)	2,939	....	....	....	....
North Kingsville village	2,939	2,458	1,854	1,271	834
Orwell township	2,220	1,727	1,613	1,283	1,101
Orwell village	1,067	965	819	759	579
Pierpont township	1,074	978	983	861	821
Plymouth township	2,029	2,225	1,576	1,161	975
Richmond township	887	793	735	768	730
Rome township	863	707	648	550	549
Roaming Shores village (see Morgan township) (6)					
Saybrook township	11,697	11,274	9,964	5,626	4,095
Ashtabula city (see Ashtabula township)					
Sheffield township	1,513	1,160	999	705	633

ASHTABULA COUNTY—*Concluded*

County and Minor Civil Divisions	1980	1970	1960	1950	1940
Trumbull township	1,330	963	840	764	666
Wayne township	652	591	592	633	620
Williamsfield township	1,224	988	906	858	908
Windsor township	1,485	1,447	1,340	1,053	894

(1) East Ashtabula (unincorporated) returned separately only in 1960 and 1950.
(2) Edgewood (unincorporated) returned separately in 1980 and 1970.
(3) Kingsville (unincorporated) returned separately in 1980 and 1970.
(4) North Kingsville village coextensive with North Kingsville township, returned in Kingsville township in 1970, 1960, 1950 and 1940.
(5) Lakeville village incorporated June, 1944, coextensive with Lakeville township, was annexed to Conneaut city December 10, 1962.
(6) Roaming Shores village incorporated August 15, 1979.

TABLE 2—POPULATION OF
1980, 1970, 19

A

Athens County was erected in 1805 f
Athens, the capital city of Greece. Ohio U
college in the Northwest Territory.

County and Minor Civil Divisions
Athens County
Alexander township
Albany village (See Lee township)
Ames township
Amesville village
Athens township
Athens city, total
In Athens township
In Canaan township
The Plains, total (unincorporated) (1)
In Athens township
In Dover township
Bern township
Canaan township
Athens city (see Athens township)
Carthage township
Dover township
Chauncey village
Lee township
Albany village, total
In Alexander township
In Lee township
Lodi township
Rome township
Trimble township
Glouster village
Jacksonville village
Trimble village
Troy township
Coolville village
Waterloo township
York township
Buchtel village
Nelsonville city (2)

(1) The Plains (unincorporated) not return
Hocking.
(2) Nelsonville city returned with a popu
enumeration and was officially procla
Sections 703.02 to 703.05, inclusive.

28

RMI Company Niles, Ohio 44446 TEL 216-652-9951 TWX 810-436-2600

HAROLD G. DEGITZ
Director of Engineering

November 7, 1973

Mr. Stasys Rastonis
Permit Branch - Region V
U.S. Environmental Protection Agency
One North Wacker Drive
Chicago, Illinois 60606

Dear Stasys:

Subject: RMI Company--Sodium and Chlorine Plant--Ashtabula, Ohio

Per your phone request of November 5, you will find enclosed a copy of a schematic drawing showing the sewer system for our Sodium and Chlorine Plant in Ashtabula. You will note from this drawing that all hypochlorite-bearing wastes enter the lagoons and are routed through the system in order to give the maximum retention time before being discharged to the sewer. You will also note that all discharge containing hypochlorites enters the sewer complex through a single pipe.

Confirming our phone conversation, it would certainly be possible for us to arrange to reroute the hypochlorite-bearing wastes for use in treating domestic sewage if such arrangements could be negotiated.

If further information in this respect is required, please advise.

Very truly yours,

H. G. Degitz
Director of Engineering

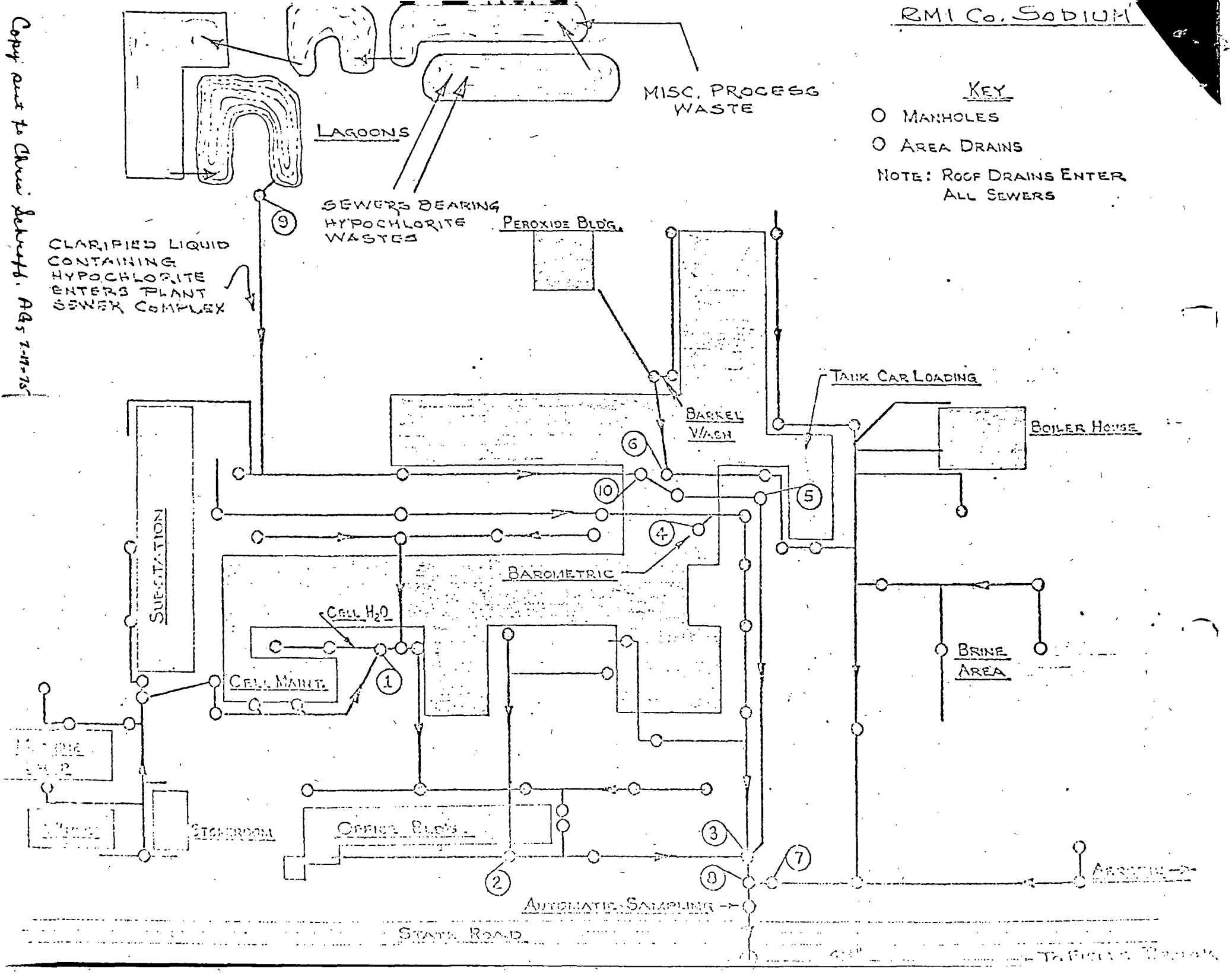
HGD/ds

Enclosure

cc: Mr. John Kelley (Without Enclosure)
Chief, Technical Review Team
Permit Branch - Region V

Copy sent to Chris Schroff, AG, 7/17/75

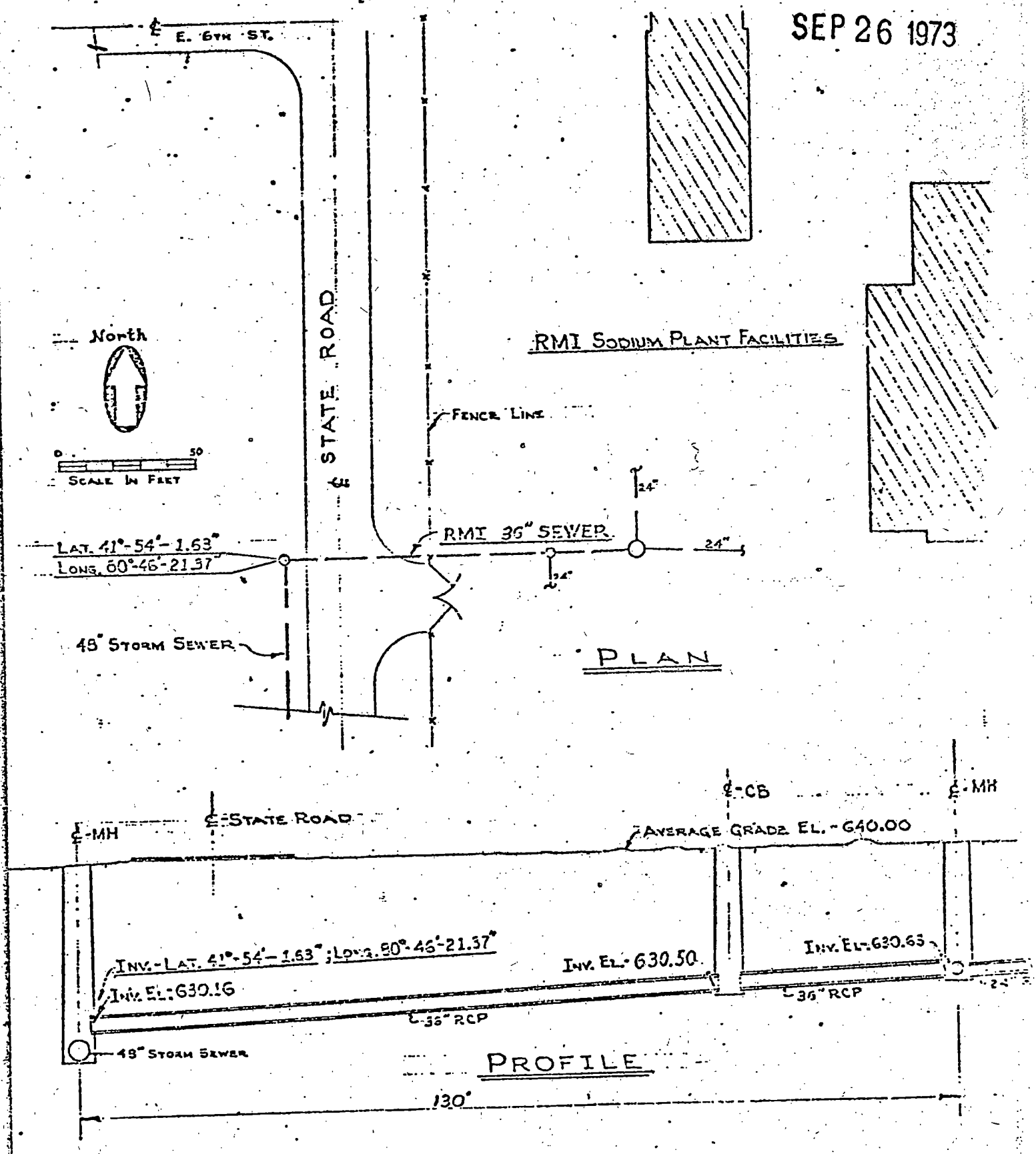
RMI Co. SODIUM



Copy sent to Chris Sekerak, AQS 7-17-75

ATTACHMENT I Page 2.

SEP 26 1973



Facilities Description

The RMI Company, Sodium plant, is engaged in the production of metallic sodium and chlorine by the electrolysis of sodium chloride by using the Downs cell process. The Sodium plant is located in Ashtabula County, on State Road, east of the intersection of State Road and East Sixth Street. The site is on the watershed of Field's Brook, a tributary to the Ashtabula River.

Wastewater Treatment

The RMI, Sodium plant has installed three different wastewater treatment systems at this site. These consist of a lime addition facility and a series of five settling ponds, a chlorine gas recovery facility, and a facility for the catalytic decomposition of hypochlorite.

In the first system, chlorine contaminated wastewater streams are reacted with lime to form hypochlorites. The resulting sludges are then allowed to settle out in the five settling lagoons. Other wastewaters, such as that from the cell parts washer, from the laundry facilities, and from boiler blowdown, are also discharged to the settling ponds.

A chlorine recovery system has been installed. In this system "tail gas" from a liquefaction process and "sniff gas" from empty tank cars is routed to a guard tank, which contains a shallow bed of silica gel to trap impurities. This cleaned gas stream is cooled by a gas chiller and then enters one of two absorption-desorption towers. As the gas stream passes through the gel bed in either tower section, the chlorine is preferentially absorbed.

The stripped gas stream then flows to the existing lime addition system so that any residual chlorine is reacted with lime and is converted to the less hazardous form. After the gel can no longer absorb additional chlorine, the incoming gas

stream is routed to the second absorption-desorption tower while the first tower is placed on a chlorine recovery cycle. The chlorine gas that is released during this cycle is then routed to the existing liquefaction system to be converted to a marketable product.

The last phase of their pollution control program consists of a facility for the catalytic decomposition of hypochlorite. The hypochlorite is generated by reacting waste chlorine gas with lime in the neutralization facility. The waste chlorine gas originates as the stripped gas stream described above and as "off gas" from the Downs cells during maintenance operations or malfunctions.

The hypochlorite wastes are collected in a two-section settling pond and pumped continuously to a heated, agitated reactor containing cobalt hydroxide as a catalyst. Oxygen is released during the reaction, and the hypochlorite waste is reduced to a chloride salt as illustrated:

$$Ca(OCl)_2 \quad \text{catalyst} \quad CaCl_2 = O_2$$

Effluent from the first reactor flows by gravity to a second reactor for additional reaction time. The second reactor discharges to a settling tank where a flocculating agent is added to aid in precipitating any catalyst particles that are carried over. The catalyst particles are recycled to Reactor No. 1. The clarified wastewater flows to a surge tank and, subsequently, to the third settling pond in the five-pond holding and settling system.

This clarified wastewater, after passing through the remaing ponds, is then discharged to the main sewer and, then, to Field's Brook.

E 312 'A'
OH 0002313

FOR AGENCY USE

80-05-05

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
APPLICATION FOR PERMIT TO DISCHARGE WASTEWATER

STANDARD FORM C – MANUFACTURING AND COMMERCIAL

SECTION I. APPLICANT AND FACILITY DESCRIPTION

Unless otherwise specified on this form all items are to be completed. If an item is not applicable indicate 'NA.'

ADDITIONAL INSTRUCTIONS FOR SELECTED ITEMS APPEAR IN SEPARATE INSTRUCTION BOOKLET AS INDICATED. REFER TO BOOKLET BEFORE FILLING OUT THESE ITEMS.

Please Print or Type

1. Legal Name of Applicant (see Instructions)	101	RMI Company
2. Mailing Address of Applicant (see instructions) Number & Street	102a	1000 Warren Avenue
City	102b	Niles
State	102c	Ohio
Zip Code	102d	44446
3. Applicant's Authorized Agent (see Instructions) Name and Title	103a	E. R. Toth, Jr., Vice President - Operations
Number & Street Address	103b	1000 Warren Avenue
City	103c	Niles
State	103d	Ohio
Zip Code	103e	44446
Telephone	103f	216 (Area Code) 652-9951 (Number)
4. Previous Application If a previous application for a National or Federal discharge permit has been made, give the date of application. Use numeric designation for date.	104	71 6 29 (YR MO DAY)

I certify that I am familiar with the information contained in this application and that to the best of my knowledge and belief such information is true, complete, and accurate.

E. R. Toth, Jr.	102e	Vice President-Operations
Printed Name of Person Signing		Title
E R Toth Jr.	102f	80 5 1 (YR MO DAY)
Signature of Applicant or Authorized Agent		Date Application Signed

FOR AGENCY USE

RECEIVED ___ ___ ___ (YR MO DAY)

OHIO EPA DISTRICT OFFICE ___

FOR AGENCY USE

5. Facility/Activity (see instructions) Give the name, ownership, and physical location of the plant or other operating facility where discharge(s) does or will occur.

Name	105a	RMI Company - Sodium and Chlorine Plant
Ownership (Public, Private or Both Public and Private)	105b	☐ PUB ☒ PRV ☐ BPP
Check block if Federal Facility and give GSA Inventory Control Number	105c	☐ FED
	105d	
Location Street & Number	105e	46 State Road, P. O. Box 550
City	105f	Ashtabula Township
County	105g	Ashtabula
State	105h	Ohio

6. Nature of Business State the nature of the business conducted at the plant or operating facility.

	106a	Electrolysis of Sodium Chloride to Manufacture Sodium and Chlorine
	106b	AGENCY USE

7. Facility Intake Water (see instructions) Indicate water intake volume per day by sources. Estimate average volume per day in thousand gallons per day.

Municipal or private water system	107a	30 thousand gallons per day
Surface water	107b	6,285 thousand gallons per day
Groundwater	107c	0 thousand gallons per day
Other*	107d	185 thousand gallons per day
Total Item 7	107s	6,500 thousand gallons per day

*If there is intake water from 'other,' specify the source. 107f: Recycle Brine from RMI Company - Metals Reduction Plant

8. Facility Water Use Estimate average volume per day in thousand gallons per day for the following types of water usage at the facility. (see instructions)

Noncontact cooling water	108a	6,120 thousand gallons per day
Boiler feed water	108b	70 thousand gallons per day
Process water (Including contact cooling water)	108c	280 thousand gallons per day
Sanitary water	108d	30 thousand gallons per day
Other*	108e	- thousand gallons per day
Total Item 8	108f	6,500 thousand gallons per day
*If there are discharges to 'other,' specify.	108g	
If there is 'Sanitary' water use, give the number of people served.	108h	350 people served

FOR AGENCY USE

9. All Facility Discharges and other Losses; Number and Discharge (see instructions) Volume Specify the number of discharge points and the volume of water discharged or lost from the facility according to the categories below. Estimate average volume per day in thousand gallons per day.

		Number of Discharge Points		Total Volume Used or Discharged, Thousand Gal/Day
Surface Water	109a1		109a2	
Sanitary wastewater transport system	109b1		109b2	
Storm water transport system	109c1		109c2	
Combined sanitary and storm water transport system	109d1	1	109d2	6,500
Surface Impoundment with no effluent	109e1		109e2	
Underground percolation	109f1		109f2	
Well Injection	109g1		109g2	
Waste acceptance firm	109h1		109h2	
Evaporation	109i1		109i2	
Consumption	109j1		109j2	
Other*	109k1		109k2	
Facility discharges and volume Total Item 9.	109l1	1	109l2	6,500
*If there are discharges to 'other,' specify.	109m1			

10. Permits, Licenses and Applications
List all existing, pending or denied permits, licenses and applications related to discharges from this facility (see instructions).

110	Issuing Agency (a)	For Agency Use (b)	Type of Permit or License (c)	ID Number (d)	Date Filed YR/MO/DA (e)	Date Issued YR/MO/DA (f)	Date Denied YR/MO/DA (g)	Expiration Date YR/MO/DA (h)
1.	Corps of Engineers		Permit to Discharge	000158	71 6 29	*	*	
	OEPA		NPDES Permit	D 312 &	USEPA No.	OH 0002313		
2.		* Refer to OEPA RMI Company-Sodium Plant Directors Findings and						
		orders Case No. 75-WD-121 & Case No. 77-3596.						
3.		6th Circuit Court of Appeals.						

11. Maps and Drawings
Attach all required maps and drawings to the back of this application.(see instructions)

12. Additional Information

112 Item Number	Information

OhioEPA

Re: Ashtabula County
RMI - Sodium & Chlorine Plant
NPDES No. E 312 *AD

Mr. B. Bertea
RMI - Sodium & Chlorine Plant
46 State Road
Ashtabula, Ohio 44004

October 7, 1980

Dear Mr. Bertea:

Please find enclosed the tabulated results of our sampling program.

If any questions arise, please advise.

Yours truly,

William T. Skowronski, P.E.
Group Chief

WTS:mjo

Enclosure

cc: Permit File

PART II, OTHER REQUIREMENTS

A. The wastewater treatment works must be under supervision of a State certified operator as required by Rule 3745-7-02 of the Ohio Administration Code (formerly OEPA Regulation EP-06-02/Ohio Sanitary Code Regulation ME-37-02) for a Class Operator

B. Description of the location of the required sampling stations are as follows:

Sampling Station	Description of Location
E 312 001	Final Effluent and Cooling Water Outfall, prior to mixing with waters of the State Road Storm Sewer
E312002	South Drainage Ditch at Entities Southern Fence Prior to Detrex Culvert
E 312 601	Discharge from No. 5 Lagoon
E 312 602	Discharge from the Sanitary Wastewater Treatment Plant
E 312 800	Ashco Intake

B X. This permit shall be modified, or alternatively, revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under sections 301(b)(2) (C), and (D), 304(b)(2), and 307(a)(2) of the Clean Water Act, if the effluent standard or limitation so issued or approved:

(1) Contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or

(2) Controls any pollutant not limited in the permit.

The permit as modified or reissued under this paragraph shall also contain any other requirements of the Act then applicable.

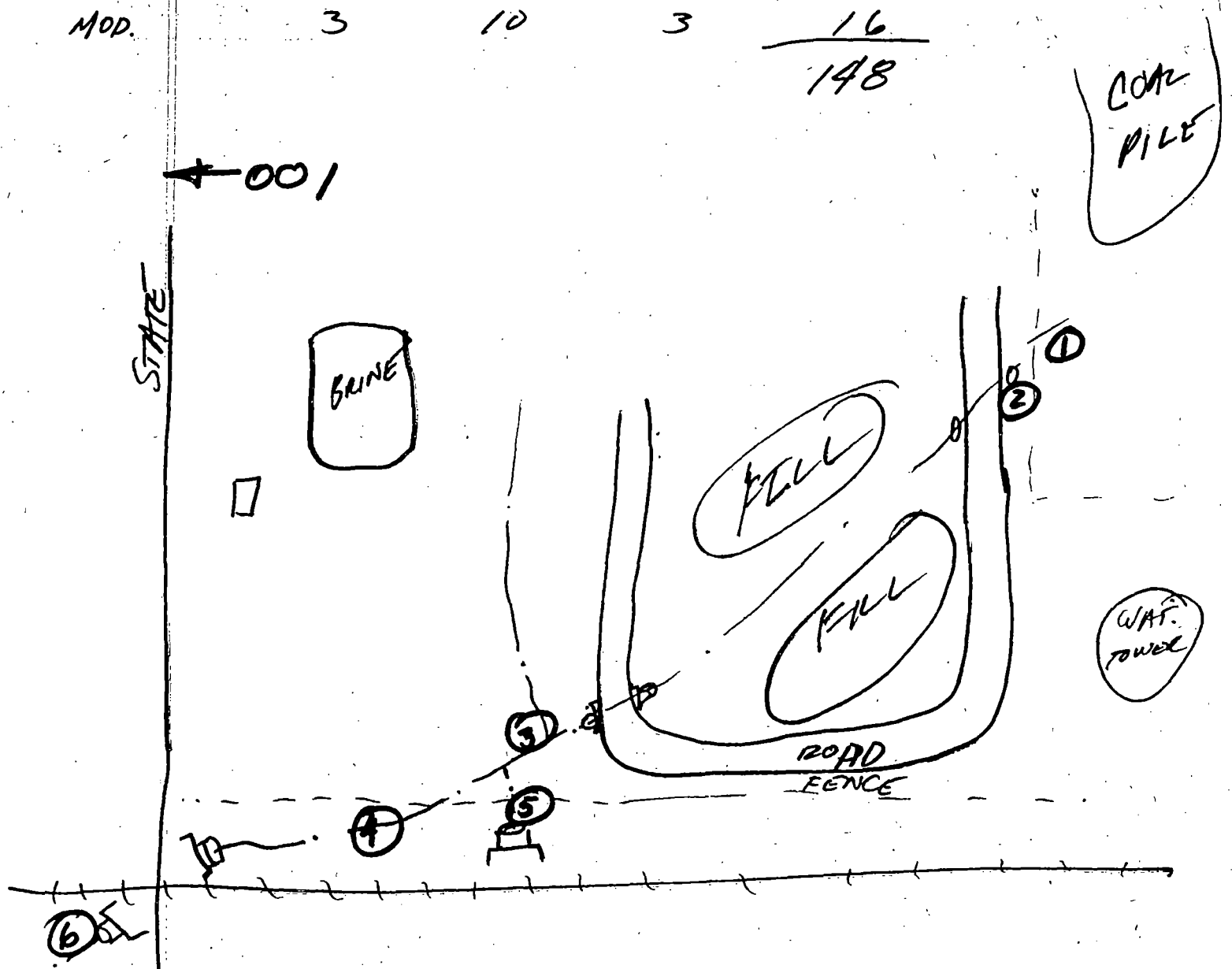
C Y. In addition to the reporting required by the paragraph entitled "REPORTING" in Part III, General Conditions, monitoring results obtained during each month shall be summarized and reported on a Discharge Monitoring Report Form (EPA No. 3320-1 or T-40 as appropriate), to be received no later than the 15th of the next month. The original copy of the report form shall be signed and mailed to:

Ohio Environmental Protection Agency
Technical Records Section
Post Office Box 1049
Columbus, Ohio 43216

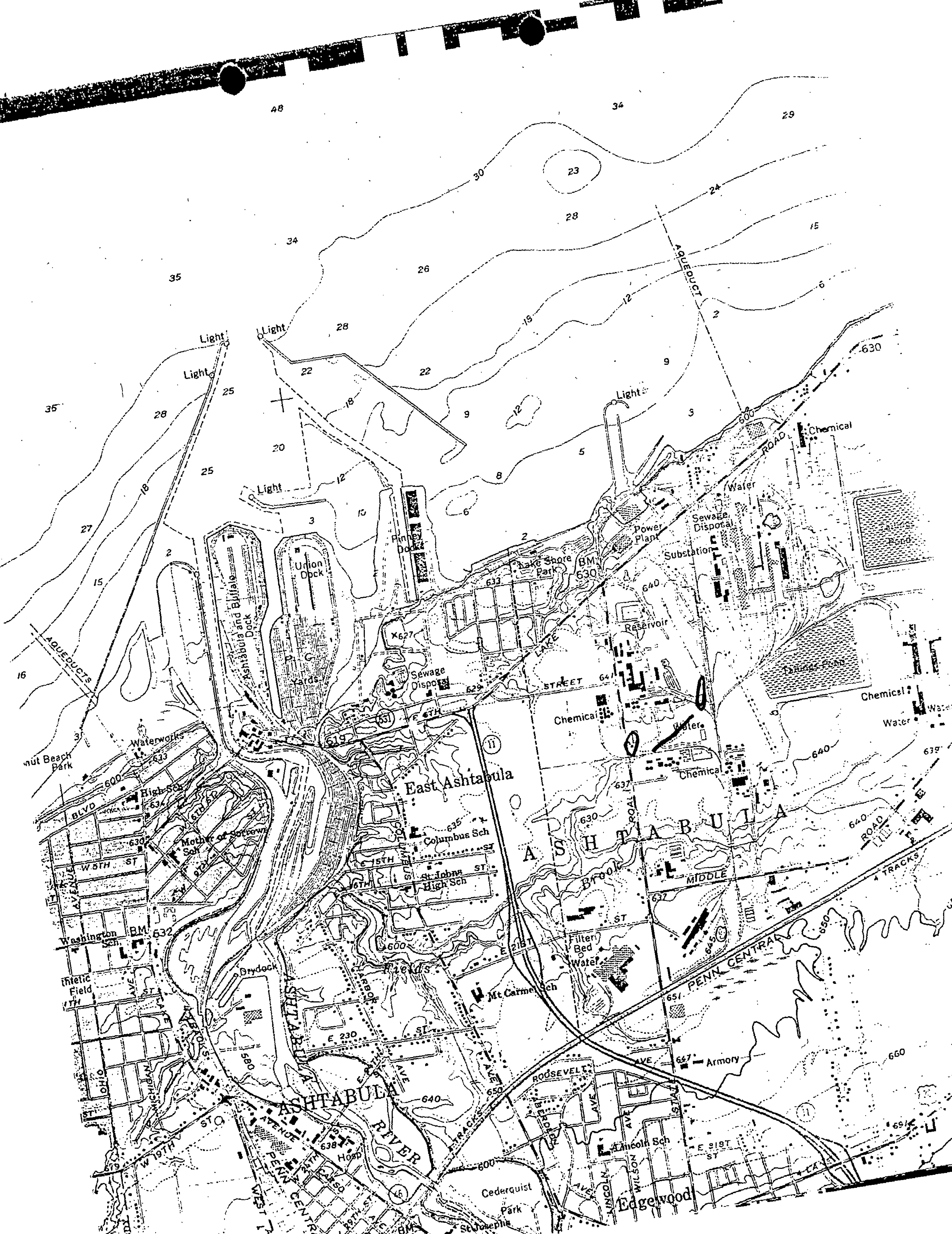
Distribution: Data Processing

RMI

①	(9 MOS) 78	'79	'80	TOTAL
NEW	3	5	7	15
RENEW	7	60	50	117
MOD.	3	10	3	16
				148



③	5	4	3	2	1
11		5/19/80	4/30/80 CSI		5/1/80 GRAB
9.7 #11.6		Tot Fe 11,600	pH 3.0		Tot Fe 12,500
S 9440 7540 14400, 11500 18800		Tot Mn 5656	TDS 16,488		Tot Mn 1450
160, 110			Tot Cr = 30		
390 35000					


Light
Light
Light
Light
Light
AQUEDUCT
AQUEDUCTS
Pinney Dock
Union Dock
Ashtabula and Buffalo Dock
P C Yards
Lake Shore Park
BM 630
Power Plant
Sewage Disposal
Substation
Chemical
Water
Reservoir
Tailings Pond
Sewage Disposal
STREET
LAKE
ROAD
Chemical
Water
Chemical
Waterworks
Walnut Beach Park
High Sch
Mother of Sorrows Sch
BLVD
East Ashtabula
Columbus Sch
St Johns High Sch
ASHTABULA
Brook
MIDDLE
4 TRACKS
PENN CENTRAL
Filter Bed
Water
Fields
Mt Carmel Sch
Washington Sch
BM 632
Drydock
ASHTABULA RIVER
ASHTABULA
Armory
ROOSEVELT
Lincoln Sch
Hosp
Cederquist Park
Edgewood
St Josephs
TRACKS
AVE
ST

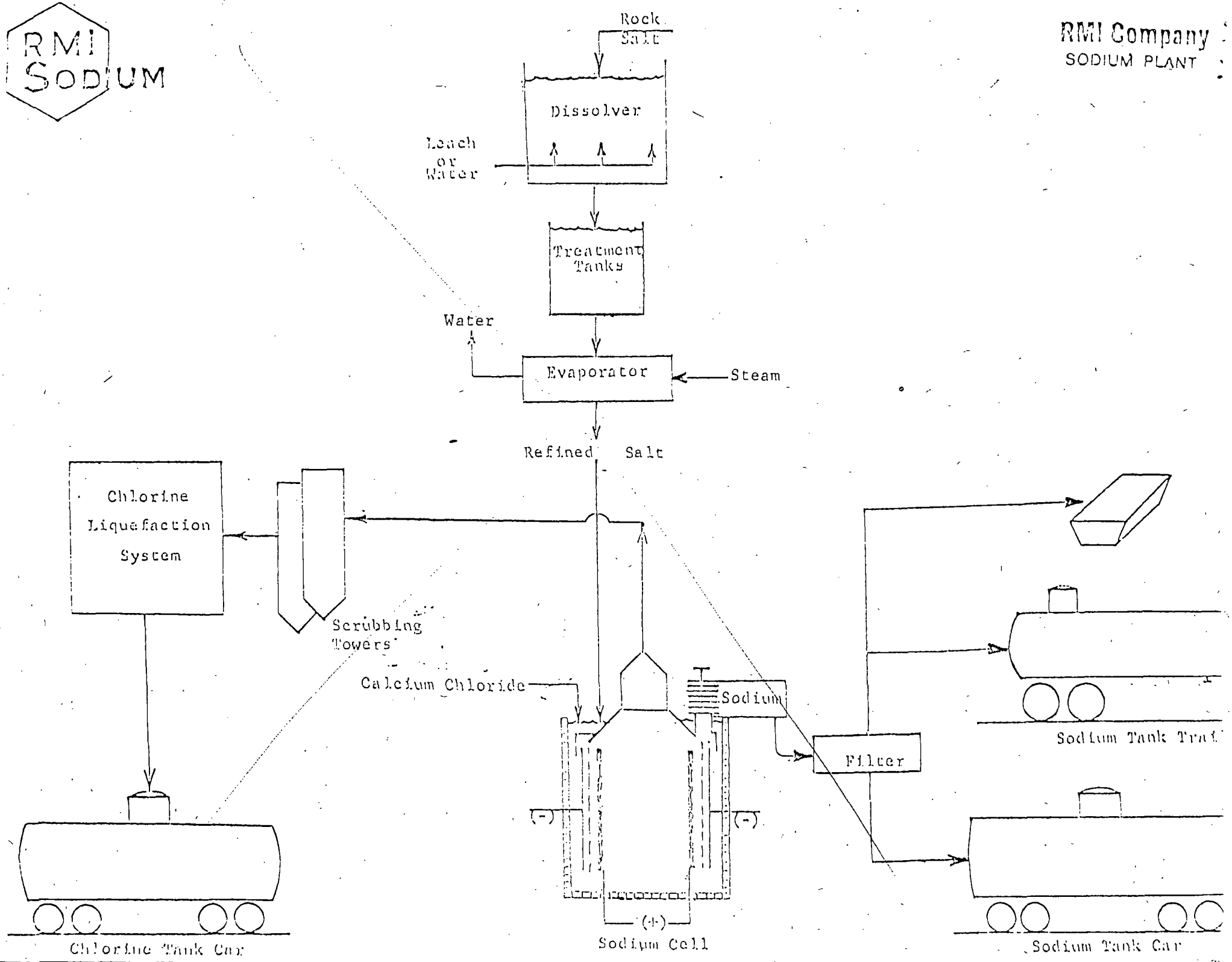
KILL Samples

	pH	Hard.	TSS	TDS	Cr.	Cu.	Fe	Pb	Hg	Mn	Zn	Phenol
4-29-80												
601	7.2	266	38	1012	<30	40	1500	16	0.5		30	6
001	7.3	216	29	740	<30	90	1620	18	1.1		60	4
4-30-80												
Site #3	3.0	5500	~~1648~~	16488	30	120	30500	70	1.7	720	600	630
5-19-80												
Site #2							12500		14150			
Site #3							11600		5650			
6-24-80												
Site #2	6.3				50		55	<0.5			130	
Site #3	5.3				<30		<5	<0.5			130	
Site #4	6.8				<30		<5	<0.5			<30	
7-14-80												
Site #2	2.9			928								
Site #3	2.8			11246								
Site #4	7.0			504								
7-15-80												
001	7.1			920								
7-21-80												
Site #2	5.6				40	100	97000	40	<0.5		280	
Site #4	8.7				<30	<30	310	<5	<0.5		<30	
bad Site #3 #4	8.0				<30	50	2570	60	<0.5		80	
7-29-80												
001	6.6			1278					0.6			

Site #3	5.3				<30		<5	<0.5		130	
Site #4	6.8				<30		<5	<0.5		<30	
7-14-80											
Site #2	2.9	928									
Site #3	2.8	1246									
Site #4	7.0	504									
7-15-80											
001	7.1	920									
7-21-80											
Site #2	5.6		40	100	97000	<10	<0.5		280		
Site #1	8.7		<30	<30	310	<5	<0.5		<30		
inbird Site #3+4	8.0		<30	50	2570	60	<0.5		80		
7-29-80											
001	6.6	1278					0.6				
Site #2	3.5	1590									
Site #3	3.1	442	40	30	10900	5	<0.5	2400	210		7
8-7-80											
001	7.1	920									
Site #2	2.9	928									
Site #3	2.8	1246									
Site #4	7.0	504									

RMI SODIUM

RMI Company
SODIUM PLANT



RMI Company
Sodium and Chlorine Plant
46 State Road
Ashtabula, Ohio 44004

August 31, 1979

Attn: Mr. E. R. Toth, Jr.

Gentlemen:

Please find enclosed an industrial status report discussing the survey that was conducted at your facilities on August 22, 1979.

During the inspection, it was noted that there were no apparent problems pertaining to the wastewater treatment facilities or to your method of sample collection.

In closing, we wish to express our appreciation for the courtesy and cooperation extended to us during the survey.

Yours truly,

Douglas C. Hasbrouck, P.E.
District Chief

REB:mjo

Encl.

Re: Solid Waste Inventory
RMI Company - Sodium Plant
RMI Company - Metals Reduction Plant
Ashtabula, Ohio 44004

RMI Company
Niles, Ohio 44446

April 16, 1979

Attention: Harold C. Dequitz
Director of Engineering

Dear Sir:

As required by Subtitle "D", Section 4005 (b) of the Resource Conservation and Recovery Act of 1976, (RCRA) the Ohio EPA is currently conducting a statewide inventory of all solid waste facilities and sites. The term solid waste is defined by RCRA so as to include sludge from an industrial wastewater treatment facility or air pollution control facility, and other discarded solid, liquid, semisolid, or contained gaseous material resulting from industrial and commercial activities.

With respect to this inventory, we are requesting the following information from you:

1. a detailed description of all waste materials generated at your facility;

2. volume of each waste material generated on a month/yearly basis;

3.a. a detailed description of your current on-site storage and/or disposal practices;

3.b. a listing of all waste removed from your property, indicating ultimate disposal site or waste treatment facility or waste recycling facility. Please include name of hauler.

Under the current Ohio Solid Waste Law, all solid waste must be disposed of in a manner approved by the Ohio EPA.

ASH 1

PRELIMINARY LAND DISPOSAL INVENTORY

Facility Location: _____ of _____, _____ mile(s)
(side of road) (road) (distance)

_____ of _____ or _____
(direction) (intersection) (town)

in _____ in _____.
(township) (county)

Property Owner: (if known) Name RMI Company - Ashtabula Sodium Plant

Address 46 State Rd (State at East 6th) Ashtabula Oh 44004 Phone 216-997-5141 P.O. Box 550

This is an: (1)on-site (2)off-site waste disposal facility.
(circle one)

Method of Disposal:
(check one)

____ trench or area dumping

____ land spreading

____ pit, pond, or lagoon

____ other

Type of Waste:
(check any that apply)

____ foundry sand

____ fly ash

SIC [redacted]

____ industrial sludge

____ municipal sludge

2819

____ septic tank pumpings

Titanium sponge
Metallic sodium
Sodium peroxide
Chlorine

____ demolition or construction

____ tree trimmings, brush, street sweepings

____ general refuse

____ other (describe) _____

Information provided by: Kinney 1-79
(name)

Agency or Department _____
(phone)

Please submit completed form to: Deborah J. Berg, R. S.
Ohio EPA
Northeast District Office
2110 East Aurora Road
Twinsburg, Ohio 44087

MS11

PRELIMINARY LAND DISPOSAL INVENTORY

Facility Location: _____ of _____, _____ mile(s)
(side of road) (road) (distance)

_____ of _____ or _____
(direction) (intersection) (town)

in _____ in _____.
(township) (county)

Property Owner: (if known) Name RMI Company Metals Reduction Plant

Address East 21st and State Road Phone 216-997-5141
Ashtabula, Oh 44004

This is an: (1)on-site (2)off-site waste disposal facility.
(circle one)

3-5-79 per Dennis Lee
Store Mercury wastes in drums on property
drums rusting & leaking
Northwest part of property between creek, lagoon, Middle Rd.
from Zirconium production
(Extrusion Plant)
SIC 3542
special metals extrusions

Method of Disposal:
(check one)

____ trench or area dumping
____ land spreading
____ pit, pond, or lagoon
____ other

Type of Waste:
(check any that apply)
(Metals Reduction Plant)
SIC 0333 ? Bob

____ foundry sand
____ fly ash
____ industrial sludge
____ municipal sludge
____ septic tank pumpings
____ demolition or construction
____ tree trimmings, brush, street sweepings
____ general refuse
____ other (describe) _____

Information provided by: Kinney 1-79
(name)

Agency or Department _____
(phone)

Please submit completed form to:

Deborah J. Berg, R. S.
Ohio EPA
Northeast District Office
2110 East Aurora Road
Twinsburg, Ohio 44087

Extrusion plant

per Barna

contaminated
radioactive waste storage in drums ~350

→ shipped to S. Carolina 30 & 55 gallons

filtered solids from NPDES & retention
floor scrubbings also

Chem-Nuclear
Systems

licensed by NRC

waste & trash
lubricating oil storage inside the building

recycle uranium building for testing

incinerate (pit precipitates)

sewage treatment package

weight sodium hydroxide. This may be sold as "standard-grade caustic liquor", concentrated to 73 percent, or further refined through removal of chloride and chlorate by various techniques. Refined caustic liquor may be sold, further concentrated to 73 percent solids, or evaporated to dryness and the anhydrous sodium hydroxide sold in solid (flake or powdered) forms. Most of the product is sold in the liquid form.

Caustic soda has many varied uses; mostly as an alkali. It has also replaced soda ash (sodium carbonate) in many uses, such as in the aluminum industry and other molten salt processes, and is used to manufacture soda ash in one plant. In 1971, the U.S. production of sodium hydroxide was 8,780,946 metric tons (9,681,397 tons) in liquid form and 493,393 metric tons (543,983 tons) in solid form.

Potassium Hydroxide (Caustic Potash)

Production methods for potassium hydroxide are very similar to those for sodium hydroxide, except that mined potassium chloride or potash brines are used as the raw material. The U.S. production of potassium hydroxide in 1971 was 179,760 metric tons (198,192 tons). Caustic potash is used as an alkali, particularly when very high purity is desired or where other factors allow it to compete with sodium hydroxide (captive production, for instance). Other uses include the manufacture of potassium salts and organic compounds containing potassium.

Sodium Metal

Sodium metal is manufactured by electrolysis of fused (molten) sodium chloride at about 600°C (1072°F). The general equation is:

$$2NaCl + \text{direct current} \rightarrow 2Na + Cl_2$$

The salt is mixed with alkali fluorides and calcium chloride to sufficiently lower the melting point, and the charge is then fused in a "Downs" cell, which is a closed rectangular refractory-lined steel box with separate anode and cathode compartments separated by an inorganic diaphragm. The graphite or carbon anode is fed into the bottom of the cell, and the cathode is iron or copper in an annular form.

Molten sodium formed at the cathode is transported to a collection vessel, from which the metal is withdrawn from the bottom, filtered, and packaged in the form of bricks of various sizes. Very pure metal results from blanketing the cell and other processing equipment with argon gas to preclude oxygen from the system. Even the less pure product, because of its reactivity, must be protected from air and water throughout the production process.

The U.S. production of sodium metal in 1971 was 138,839 metric tons (153,075 tons). One of its major uses is in the manufacture of tetraethyl lead and other organometallic compounds. Other uses include

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production of sodium cyanide, sodium peroxide, titanium, and zirconium. It is also used in liquid form as a nuclear reactor coolant and as a light, thermally-conductive solid in various applications.

Potassium Metal

Potassium is produced by the reaction of potassium chloride with sodium vapor:

$$KCl + Na + Heat \rightarrow K + NaCl$$

Since it is relatively more reactive than sodium, the reaction between potassium and carbon (plus a tendency to form explosive carbonyls) precludes the manufacture of potassium by electrolysis. Since it is more expensive than sodium, potassium has very limited uses. Major uses include manufacture of organo-potassium compounds and production of NaK (sodium potassium alloys used in lard modification and as a nuclear reactor coolant). Total U.S. production in 1972 was about 100 metric tons (110 tons).

Hydrochloric Acid

There are two major processes used for hydrochloric acid manufacture. The process to be considered in this report is direct reaction of chlorine with hydrogen, by:

$$Cl_2 + H_2 \rightarrow 2HCl$$

The second major source of production for hydrochloric acid, as a by-product of organic chlorination reactions, is the dominant source. This source was studied under a different program (organic chemicals). By-product hydrochloric acid is typically of lower purity than that produced by direct reaction.

In the production of hydrochloric acid by direct reaction, hydrogen and chlorine gases are reacted in a vertical burner. The product hydrogen chloride so formed is cooled and then absorbed in water. Exhaust gases are scrubbed, and acid values are recycled. End products may include strong acid (36 percent or 22°Be) from the cooler, weak acid (18°Be) from the absorber column, a mixture of these (20°Be), or anhydrous HCl. The anhydrous acid may be prepared by stripping gaseous HCl from strong acid. The condensate and column bottoms from this process may then be recycled back into the hydrochloric acid recovery process.

Approximately 90 percent of the current production is byproduct, and supply often exceeds demand. Uses include pickling of steel, chlorination reactions (in place of chlorine), and a variety of uses as

suspended solids and then discharged. At plants where the utilization of the spent drying acid and calcium hypochlorite solution is not possible, it is recommended that the spent acid be sold to a "decomp" sulfuric acid plant and the calcium hypochlorite solution be recovered and marketed as a bleach product. The recommendations are based on the discharge volume of process water other than barometric condensers and should contain suspended and dissolved solids but no harmful metals or other pollutants.

The following limitations constitute the quantity or quality of pollutants or pollutant properties which may be discharged after application of the best practicable control technology currently available by sodium metal manufacture plants:

TSS	0.23 kg/kkg (0.46 lb/ton)
Harmful metals and pollutants	0

30 day ave.

Sodium Sulfite

Sodium sulfite is manufactured by the reaction of sulfur dioxide with soda ash. The process wastes are mainly sulfides from product purification and sodium sulfite/sodium sulfate solutions from the product dryer ejector, filter washings and vessel cleanouts. Exemplary plant 168 is the only sodium sulfite plant currently treating the waste sulfite-containing solutions to oxidize sulfite to sulfate. The efficiency of this aeration treatment is about 94 percent. An additional filtration treatment is given to the process waste water which removes 98 percent of the suspended solids. The recommendations are based on the waste stream flow emanating from the dryer ejector and filter wash operations of this plant at the high end of its range (630 liters per kkg or 150 gal/ton) and contains dissolved and suspended solids and sulfite ion, but no harmful metals or other pollutants.

The following limitations constitute the quantity or quality of pollutants or pollutant properties which may be discharged after application of the best practicable control technology currently available by sodium sulfite plants:

TSS	0.016 kg/kkg (0.032 lb/ton)
Harmful metals and pollutants	0
COD	1.7 kg of dichromate ion/kkg

Category 3 Chemicals

Chlorine-alkali (diaphragm cell), chlorine-alkali (mercury cell), hydrogen peroxide (electrolytic), sodium dichromate, sodium sulfate, titanium dioxide (chloride process) and titanium dioxide (sulfate process) were placed in this category. Category 3 chemical plants,

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Sodium Chloride

The major source of the discharged sodium chloride dissolved solids waste generated at plant 030 emanates from carryover in the barometric condensers. The Level II technology recommended for brine mining evaporative process sodium chloride plants is to replace the barometric condensers with non-contact heat exchangers and recycle the steam condensate to the evaporators. The effluent limitations guidelines for evaporative process sodium chloride plants based on the application of the best available technology economically# achievable require no discharge of process waste water pollutants to navigable waters.

Sodium Metal

Best available technology for sodium metal-chlorine plants is:

a. Recycle of the wastes from cell washdowns to brine purification after removal of suspended solids.
b. Recovery of the calcium hypochlorite waste from the tail gas scrubber as a product and recycle of water to the scrubber, or replace the scrubber with a chlorine-burning hydrochloric acid facility.
c. Recycle the spent sulfuric acid used for drying the chlorine to a "decomp" sulfuric acid plant or sell to a possible user of weak acid.

The effluent limitations guidelines for sodium metal-chlorine plants based on the application of the best available technology economically achievable require no discharge of process waste water pollutants to navigable waters.

Sodium Sulfite

Best available technology for sodium sulfite plants is recovery of the sodium sulfate from the waste discharge by evaporation and sale as a by-product. This should not be too costly since the volume of effluent from exemplary plant 168 averages only 1426.5 cu m per day (3700-7000 gallons per day), and the dissolved solids in this stream are mostly sodium sulfate.

The effluent limitations guidelines for sodium sulfite plants based on the application of the best available technology economically achievable require no discharge of process waste water pollutants to navigable waters.

Category 3 Chemicals

Chlor-alkali (diaphragm cell), chlor-alkali (mercury cell), hydrogen peroxide (electrolytic), sodium dichromate, sodium sulfate, titanium dioxide (chloride process) and titanium dioxide (sulfate process) are included in this subcategory.

existing sulfur dioxide control equipment which invoves waterborne waste can be converted to a waste-free basis by concerntration and recovery of dissolved solids. Since the recovered solid is sodium sulfate for which there is a market, this approach will be analyzed in Section VIII.

Sodium Metal

Sodium metal is produced in a Downs Cell Process. Chlorine, produced simultaneously with the sodium, is covered in this Section VII under chlorine. The treatment and control problems for chlorine once it leaves the cell are the same for the Downs Cell product as for the mercury and diaphragm cells chlorine. Therefore, no discussion of chlorine treatment and control will be made in this subsection.

The non-chlorine based wastes consist of brine purification muds, cell wastes such as bricks, graphite, sodium chloride and calcium chloride, and sodium-calcium sludge from the sodium cooling and purification step. Settling ponds may be used for mud removal. Bricks, graphite and other solids may be landfilled. Sodium chloride and calcium chloride may be washed down and allowed to flow to surface water.

In the exemplary plant of this study, (no. 096), the only cellbased wastes not land dumped are the sodium and calcium chlorides. These salts, lost to the extent of an estimated 88 kilograms/kkg of sodium produced, result from cell dumpings, wash tanks, and run offs. These wastes are not currently controlled, and are allowed to run off over the land into surface water. Isolation and collection would make it possible to recover and reuse the sodium and calcium chlorides in the incoming brine system. The simplest procedure would be to recycle this weak brine into the brine purification system. If this procedure is not satisfactory, then the fairly small stream can be concentrated to recover, first any calcium sulfate or sodium sulfate, secondly sodium chloride, and finally, calcium chloride. Sodium chloride and calcium chloride can be dumped. Sodium sulfate can be sold or it may be containerized and disposed of to landfill.

Treatment methods for chlor-alkali facilities to eliminate the discharge of process waste water pollutants are applicable to chlorine production using the Downs Cell Process.

Copy sent to Chris Schrupp

calcium chloride for sale. The total recovery of calcium chloride is not practical because of the limited market value. The only treatment used at this plat is a settling pond to reduce the concentration of suspended solids in the effluent. Therefore the Level I guideline recommendations are not based on by-product recovery, but upon the water flow necessary to maintain the total calcium chloride by-product formed in the process at a 10% concentration at discharge (6,900 l/kkg of soda ash (1,650 gal/ton). Suspended solids but no harmful metals or other pollutants should also be present. The following limitations constitute the quantity or quality of pollutants or pollutant properties which may be discharged after application of the best practicable control technology currently available:

TSS	0.17 kg/kkg (0.34 lb/ton)
Harmful metals and pollutants	0

Sodium Chloride (Brine Mining)

Sodium chloride manufacture by this process involves pumping of water into an underground salt deposit (solution mining) and returning brine for treatment to remove impurities and then to multiple effect evaporators to crystallize and collect the pure sodium chloride for sale. At exemplary plant 030, the brine sludges from the brine purification step are disposed of by returning them to the mine. Other sources of waste water are the purges from the evaporators, spills and the barometric condenser. All of the concentrated brine wastes are recycled to the process. The current plant effluent is neutral in pH and low in suspended solids.

The following limitations constitute the quantity or quality of pollutants or pollutant properties which may be discharged after application of the best practicable control technology currently available by solution mining evaporative process sodium chloride plants are:

TSS	0.15 kg/kkg (0.30 lb/ton)
Harmful metals and pollutants	0

Sodium Metal

The process for the manufacture of sodium metal, commonly called the Downs Cell Process, is essentially dry. However, water-borne wastes are generated during cleanout and washdown of cells when the electrolyte is replenished, from scrubbing chlorine tail gases and from drying the chlorine with sulfuric acid. At exemplary plant 096, the spent drying acid is not discharged but used elsewhere in the works complex. The wastes from cell wash-downs, runoff water and residual chlorine-containing water from the tail gas scrubber are ponded to settle

This facility is exemplary in having good pH and suspended sol control and reuse of some wastes, but there are large amounts chlorides being discharged which could be recycled for process reuse.

Sodium Chloride (Solution Mining of Brines)

Sodium chloride is produced by three methods: 1. Solar evaporation seawater; 2. Solution mining of natural brines; mined mineral frequently sold as-is to users. In some cases the rock salt recove is purified, but in these cases, the methods used are the same as th employed with solution-mined brines. In this report, we discuss first two methods of sodium chloride production, as contacts with industry have revealed there are no waterborne wastes norm associated with the conventional mining operations. Processes discussed previcusly.

Saturated brine for the production of evaporated salt is usua obtained by pumping water into an underground salt deposit and remo the saturated salt solution from an adjacent interconnected well, from the same well by means of an annular pipe. Besides sod chloride, the brine will contain some calcium sulfate, calcium chlor magnesium chloride, and lesser amounts of other materials including salts and sulfides.

The chemical treatment given to brines varies from plant to p depending on the impurities present. Typically, the brine is f aerated to remove hydrogen sulfide and, in many cases, small amounts chlorine are added to complete sulfide removal and oxidize all salts present to the ferric state. The brine is then pumped to sett tanks where it is treated with soda ash and caustic soda to remove of the calcium, magnesium and iron present as insoluble salts. A clarification to remove these insolubles, the brine is sent to multi effect evaporators. As water is removed, salt crystals form and removed as a slurry. After screening to remove lumps, the slurr washed with fresh brine to remove fine crystals of calcium sulfate the mother liquor to the slurry. These solids are returned to evaporator. The calcium sulfate concentration in the evapor eventually builds up to the point where it must be removed by "boi out" the evaporators.

The washed slurry is filtered, the mother liquor is returned to evaporators, and the salt crystals from the filter are drie screened. Salt thus produced from a typical brine will be of percent purity or greater. Some plants do not treat the raw brine, control the calcium and magnesium impurities by watching concentrations in the evaporators and bleeding off sufficient brin maintain predetermined levels. By such methods, salt of better 99.5 percent purity can be made. In either case, the final screenin the dried salt yields various grades depending on particle size.

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Copy sent to Chris Shirley 7-17-75

Waste Products	Process Source	kg/kkg of Product (lb/ton)
NaCl	Process	50-65 (100-130)
Misc. Alkaline Salts	Process	25-35 (50-70)
$Ca(OCl)_2$	Chlorine Recovery	45-75 (90-150)
Fe	Cooling Tower	0.065-0.095 (0.13-0.19)

The process does not normally shut down. The discharges result from the replacement of cells.

At the exemplary plant, cooling tower blowdowns and residual chlorine from tail gas scrubbers are discharged without treatment. The stream containing calcium hypochlorite wastes is not discharged but is used to treat cyanide wastes. Cooling water is discharged without treatment and tank wash and runoff water are first ponded to settle out suspended materials and then discharged.

The water input to the plant is well water in the amount of 2,730 cu m/day or 46,300 l/kkg of product (11,100 gal/ton), having an impurity content of:

Total Solids	110-125 mg/l
CO_2	30-60 mg/l
Hardness (as Ca)	80-100 mg/l
Fe	1-3 mg/l
Cu	0.02-0.06 mg/l
Zn	0.02 mg/l
Sulfate	2-7 mg/l
Alkalinity ($CaCO_3$)	70-100 mg/l

The water use within the plant is as follows:

Use	Flow	Amount	Recycle
Cooling	29,100 cu m/day (7.7 MGD)	497,000 l/kkg (119,000 gal/ton)	
Process	530 cu m/day (0.14 MGD)	9,000 l/kkg (2,150 gal/ton)	

The 2% recycled process water is used in the calcium hypochlorite absorber. Table 12 lists the various plant waste streams and their compositions.

These stream effluents consist mostly of dissolved sodium chloride and other chlorides. Table 13 shows the results of analyses of simultaneous samples from three of the waste streams (those corresponding to streams 2, 3, and 4 of Table 12) performed by plant 096 and GTC. Good agreement between the results was generally obtained.

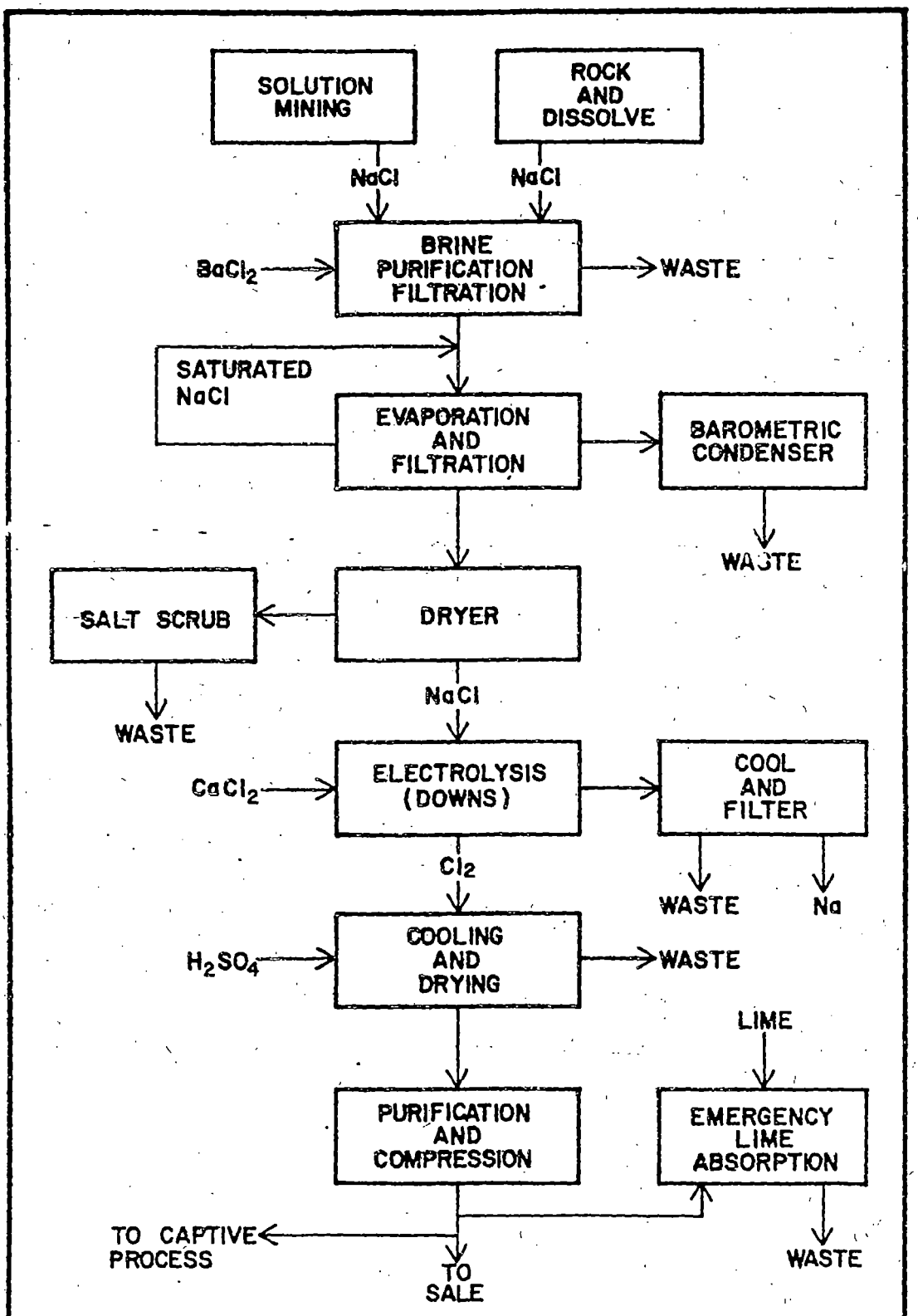


FIGURE 18
STANDARD CHLORINE-SODIUM DOWNS CELL
PROCESS FLOW DIAGRAM

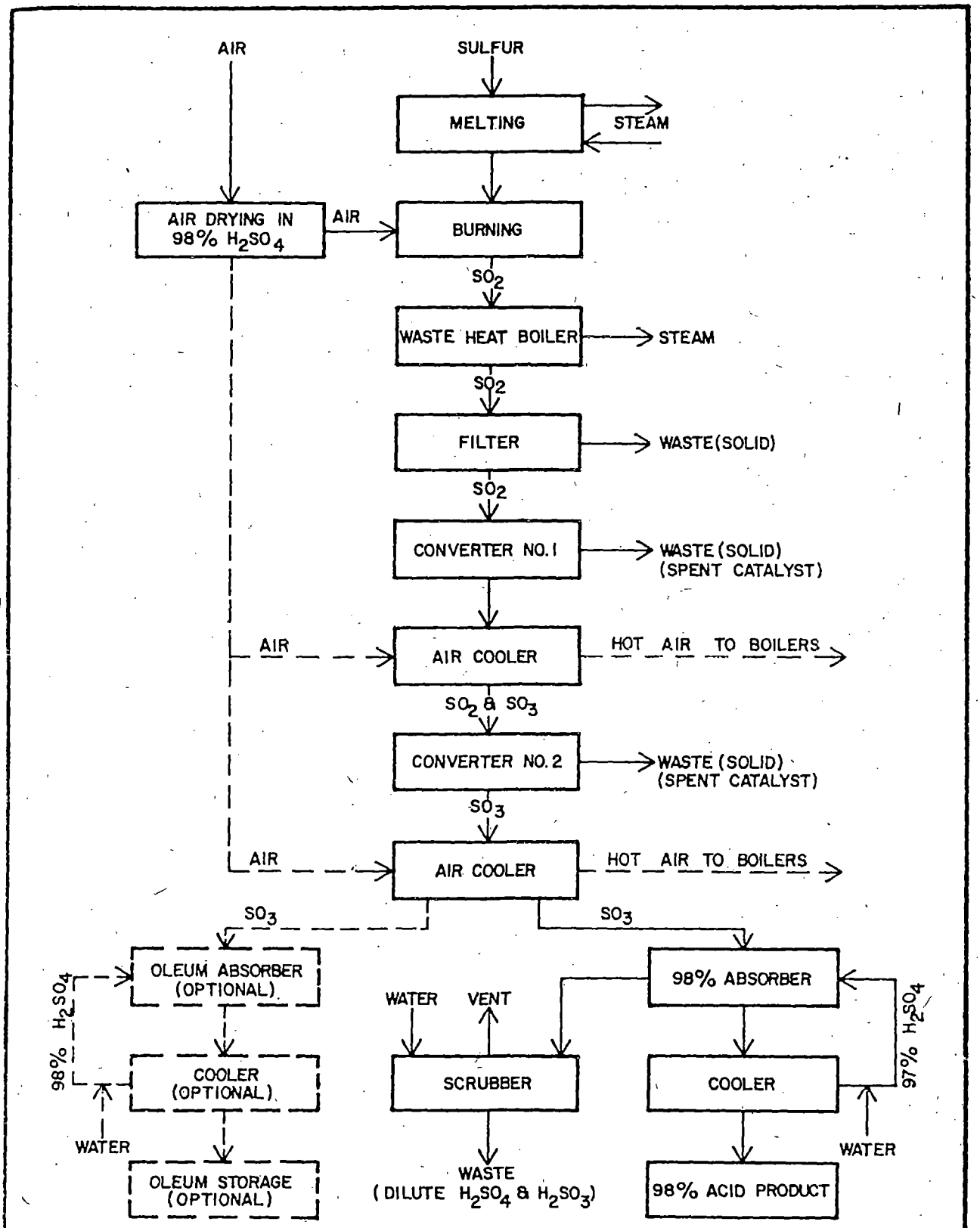


FIGURE 17

STANDARD SULFURIC ACID SINGLE ABSORPTION FLOW DIAGRAM (CONTACT PROCESS)

Picture sent to Chris Schrock 7-17-75

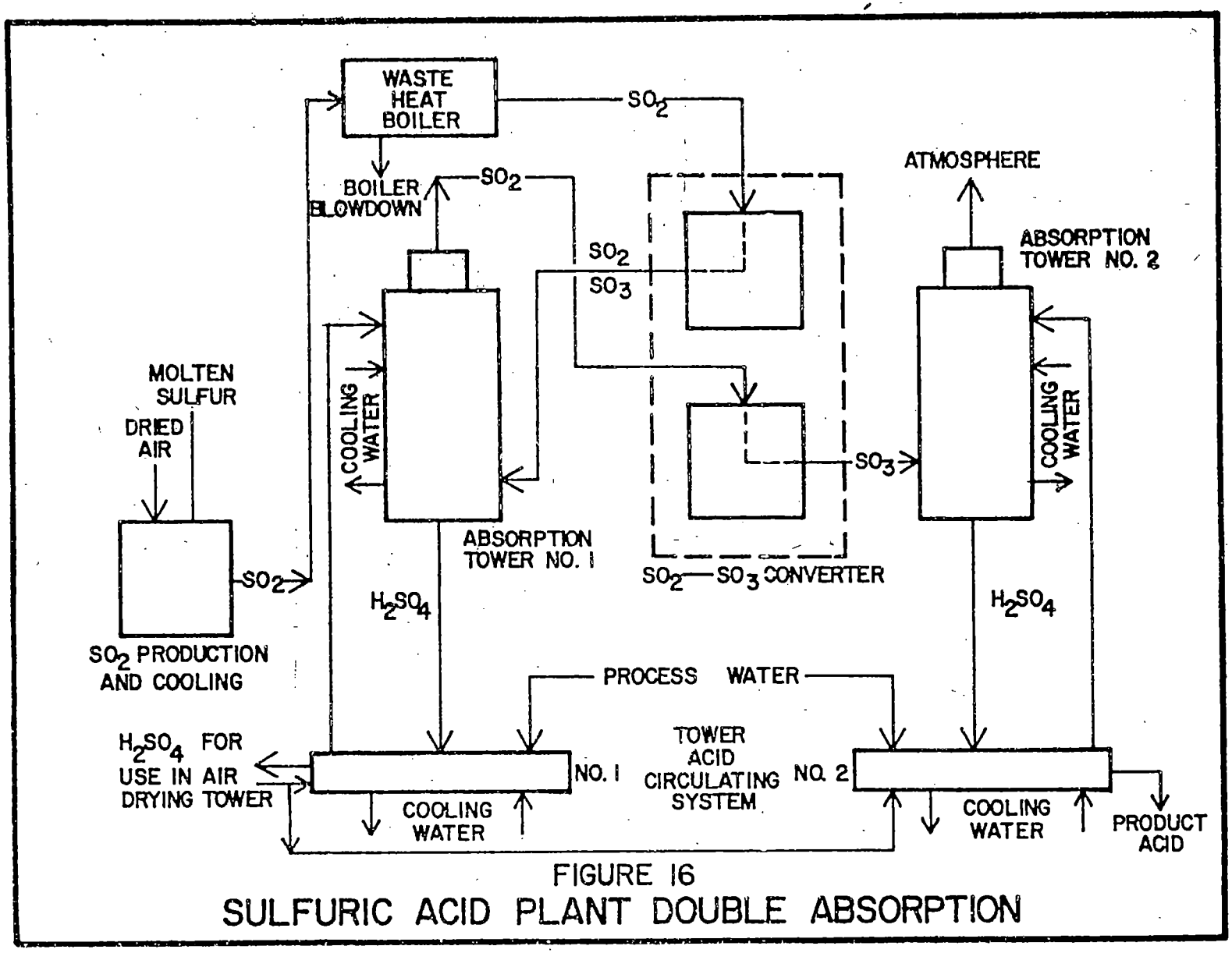


FIGURE 16

SULFURIC ACID PLANT DOUBLE ABSORPTION

Copy sent to Chris Shirey 7-17-75

in place of, or in addition to, sulfur as a raw material. While the acid production parts of these plants are the same as those for single absorption, these plants are unique because of the spent acid pyrolysis units used to convert the waste sulfur acid raw materials to a sulfur dioxide feed stream.
In this program only the first two types of plants are considered. In the double absorption contact process, sulfur is burned to yield sulfur dioxide which is then passed through a catalytic converter with air to produce sulfur trioxide. The sulfur trioxide is then absorbed in 95-97% sulfuric acid. The gases emerging from the absorber are then fed to a second converter to oxidize the remaining sulfur dioxide to sulfur trioxide which is then absorbed in a second absorption tower, and the tail gases are vented to the atmosphere.

As in other versions of the contact process, 95-97% sulfuric acid is used in the absorption towers. Pickup of sulfur trioxide in this medium converts it to 98% acid. Some of this acid is drawn off for sale and the remainder is diluted back to 96-97% and recirculated through the absorption towers. A process flow diagram is given in Figure 16.

The single absorption process differs from that previously described only in the arrangement of the converters and absorbers. The rest of the process is the same. For the single absorption process, the sulfur dioxide is passed through one or more converters and then into one or more absorbers prior to venting to the atmosphere as is shown in Figure 17. This arrangement is less effective for both conversion of sulfur dioxide to sulfur trioxide and for absorption of the sulfur trioxide into the absorber sulfuric acid. As a result, the tail gases may have to be scrubbed and this may create a water-borne waste not present for double absorption plants.

Category 2 chemicals

The manufacturing processes whose effluents are characterized by suspended solids and no metals are described below.

Sodium

Sodium is manufactured by electrolysis of molten salt in a Downs Cell. After salt purification to remove magnesium salts and sulfates, the sodium chloride is dried and fed to a Downs electrolytic cell, where calcium chloride is added to give a low-melting $CaCl_2$ NaCl eutectic, which is then electrolyzed. Sodium is formed at one electrode, collected as a liquid, filtered and sold. The chlorine liberated at the other electrode is first dried with sulfuric acid and then purified, compressed, liquefied and sold. A detailed standard process diagram is given in Figure 18.

Sodium sulfite

Burgess & Niple, Limited
Engineers
5085 Reed Road • Columbus, Ohio 43220 • (614) 459-2050

b&n 1912

20

July 27, 1981

Mr. Issa H. Shamiyeh
Manager
Corporate Engineering Department
Detrex Chemical Industries, Inc.
4000 Town Center
Southfield, Michigan 48075

Re: Ashtabula Plant - Subsurface Investigation

Dear Mr. Shamiyeh:

In order to confirm our telephone discussion of July 20, 1981, I wish to re-iterate the following items:

1. Water Well Logs

There are no located water well logs within 2,000 feet of the Ashtabula plant site. A located water well log is one which the location has been field varified by Ohio Department of Natural Resources, Division of Water personnel. There are only 12 located well logs in all of Ashtabula County. From a cursory review of the unlocated well log file, there are no well logs within 2,000 feet of the site. A more thorough review will be conducted as part of our preliminary report.

The closest wells to the plant are indicated as No. 8 and No. 12. The logs are attached and indicated on the attached map. Well No. 8 is located about 8,000 feet south of the plant and No. 12 is located about 13,000 feet northeast of plant. Both wells indicate a clay formation near the surface with shale bedrock. The wells are very poor groundwater producers with a yield of 1 and 0.1 gallon per minute.

2. Oil and Gas Wells

The well log for one gas well has been located approximately 2,500 feet south of the plant site. The permit number for this well is 952 and the well log is attached along with the location noted on the map. This well encountered 1,433 feet of Ohio shale as the uppermost bedrock unit at the well site. There is a record of another well near Well 825 which was drilled to a depth of 700 feet and abandoned. This well has a plugging permit of 175.

3. Brine Wells

There is no record of any brine or salt wells having been drilled within 2,000 feet of the property. There is also no record of brine wells in all of Ashtabula Township.

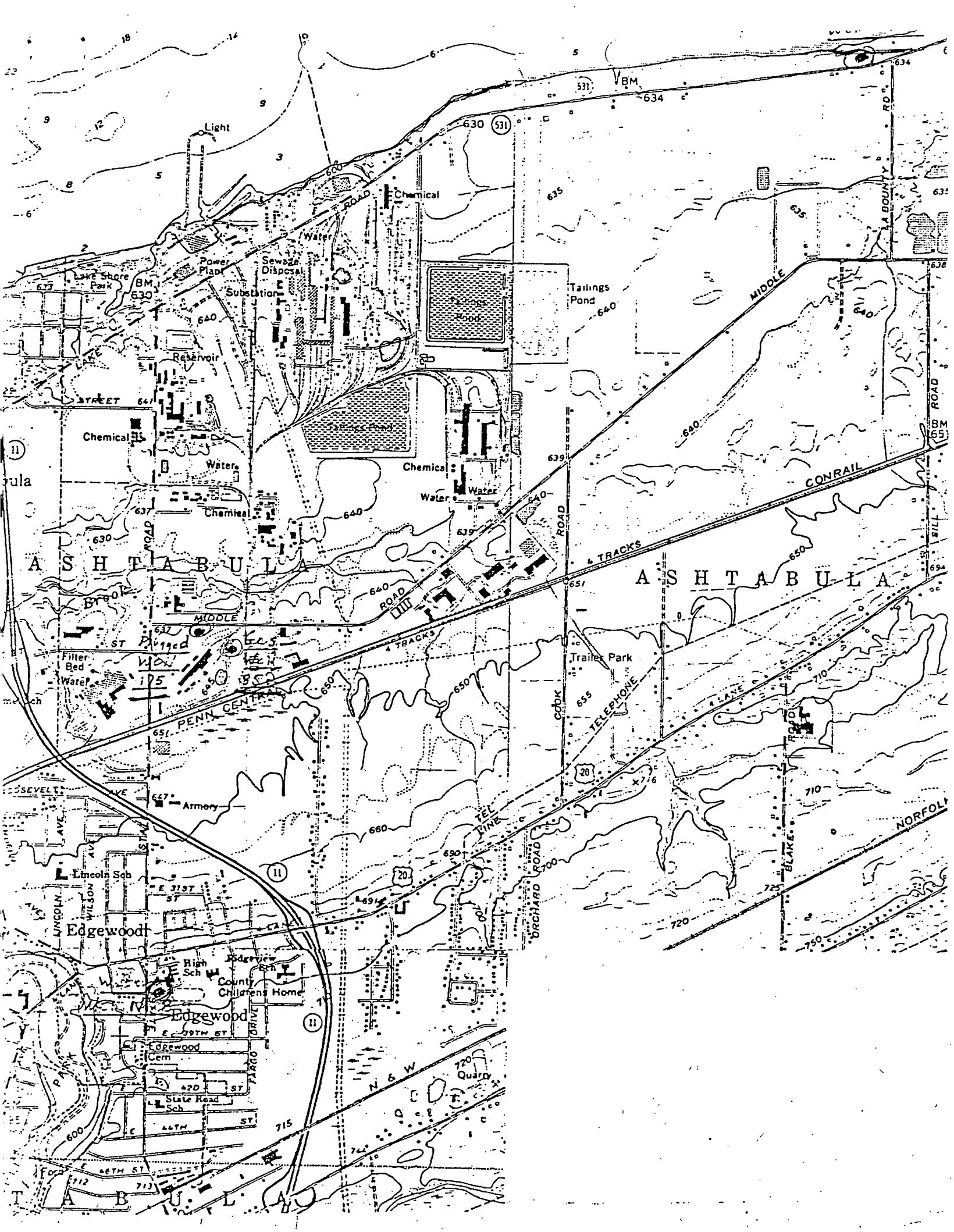
If you have any questions on these items, please do not hesitate to call.

Very truly yours,

Mark R. Rowland

Mark R. Rowland

MRR:ph
Attachments


Light
Chemical
Water
Power Plant
Sewage Disposal
Substation
Lake Shore Park
BM 630
Reservoir
Tailings Pond
Pond
LAKE STREET
MIDDLE ROAD
CONRAIL
4 TRACKS
Chemical
Water
Chemical
Water
Water
Chemical
ASHTABULA
ASHTABULA
BROOK ST
MIDDLE ST
Filter Bed
Water
Trailer Park
PENN CENTRAL
4 TRACKS
TELEPHONE
4 LANE
COOK ROAD
ORCHARD ROAD
BLAKE ROAD
NORFOLK
Armory
Lincoln Sch
Edgewood
High Sch
Edgewood Sch
County Childrens Home
Edgewood Cem
State Road Sch
N & W
Quarry
ASHTABULA
BM 634
BM 651
LA BOUNTY ROAD
SILL ROAD

OR TYPEWRITER.
DO NOT USE INK.

Division of Water
1562 W. First Avenue
Columbus, Ohio

No. 241682

County Ashtabula Township Ashtabula Section of Township 4

Owner [illegible] Myers Address Eureka Rd.

Location of property ½ mile South Eureka Rd.

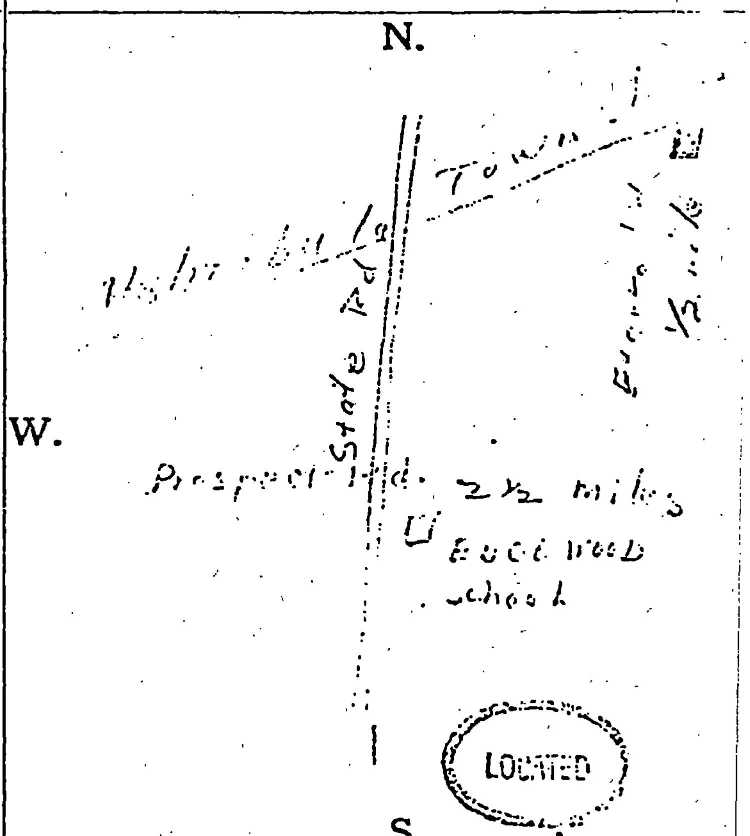
CONSTRUCTION DETAILS	BAILING OR PUMPING TEST
Casing diameter 5 1/4 Length of casing 20'	Pumping rate 10 G.P.M. Duration of test 7
Type of screen Length of screen	Drawdown ft. Date 8/24/59
Type of pump	Developed capacity
Capacity of pump	Static level—depth to water
Depth of pump setting	Pump installed by
Date of completion	

WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
Blue Clay	0 Feet	15 Ft.
Shale	15'	83'
Total dept 83 feet.		
SALT		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, e



See reverse side for instructions

Drilling Firm PHIL E. McGILL Date 8/24/59

Address Rte 2 [illegible] Rd., Ashtabula Signed [illegible]

Water Well No. 8

PLEASE USE PENCIL OR TYPEWRITER

DO NOT USE INK

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus, Ohio 43212

No 347752

County Ashtabula Township Geneva Section of Township

Owner Hotel Inman Address 4815 Lake Rd. Geneva O.

Location of property Lake Rd. 2 mi. E. of State Rd.

CONSTRUCTION DETAILS

Casing diameter 6" O.D. Length of casing 65'

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion 4-17-65

BAILING OR PUMPING TEST

Pumping Rate 10 G.P.M. Duration of test 5 hr

Drawdown 120 ft. Date 9-17-65

Static level-depth to water 30

Quality (clear, cloudy, taste, odor) Soft

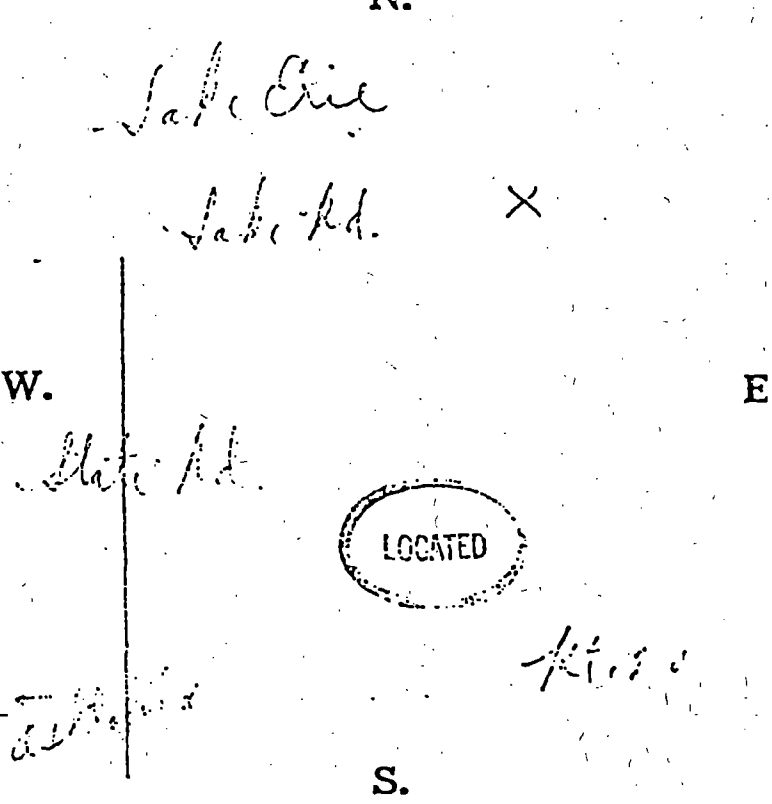
Pump installed by

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
Clay	0 Feet	60 Ft.
Shale	60	200

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm HAROLD INMAN WELL DRILLING RT. 2-JEFFERSON, OHIO Date

Address Signed

*If additional space is needed to complete well log, use next consecutive numbered form

Water Well No. 12

Gas Well (9

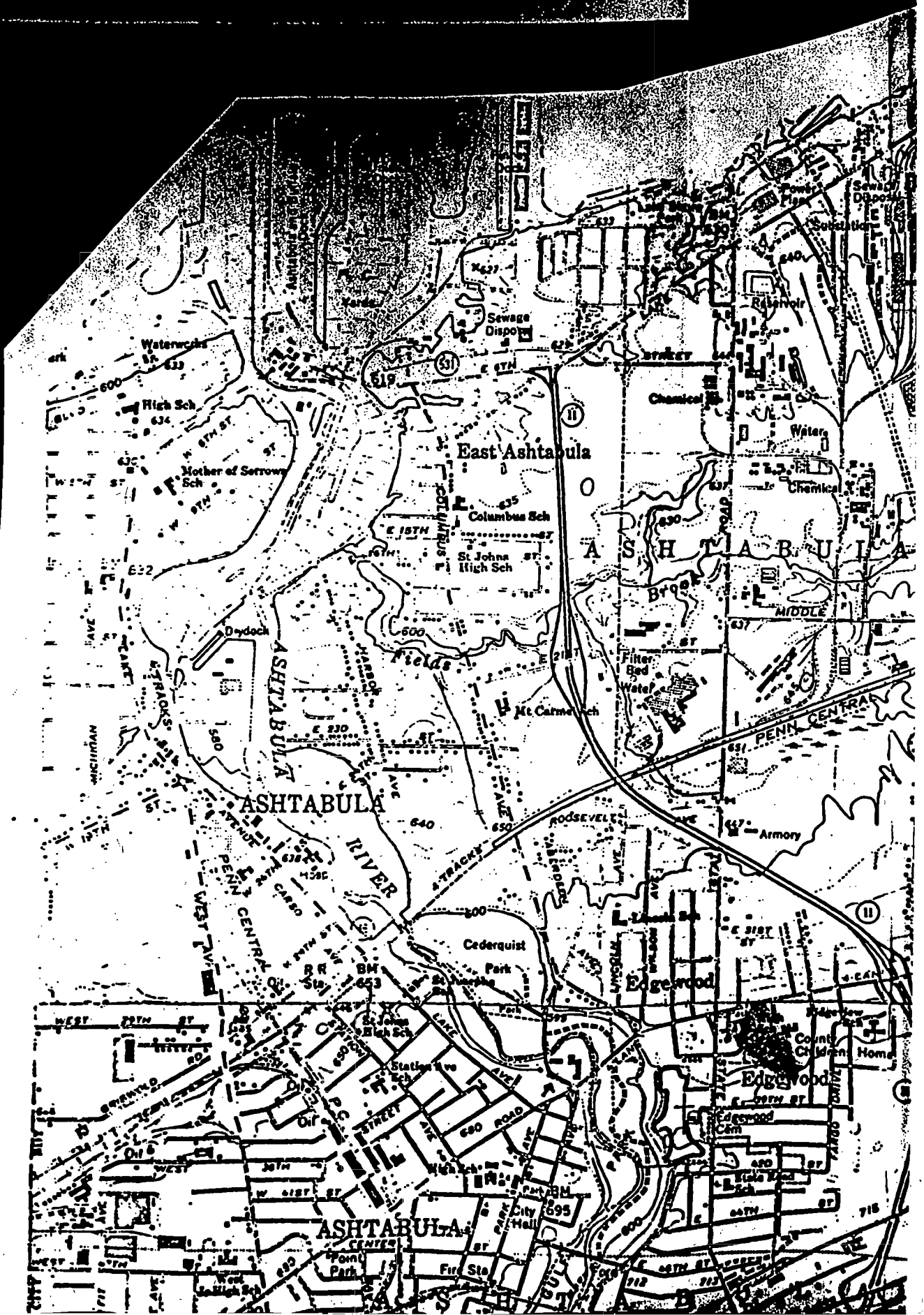
P.S.I:GRN,D,Cal.Gd.

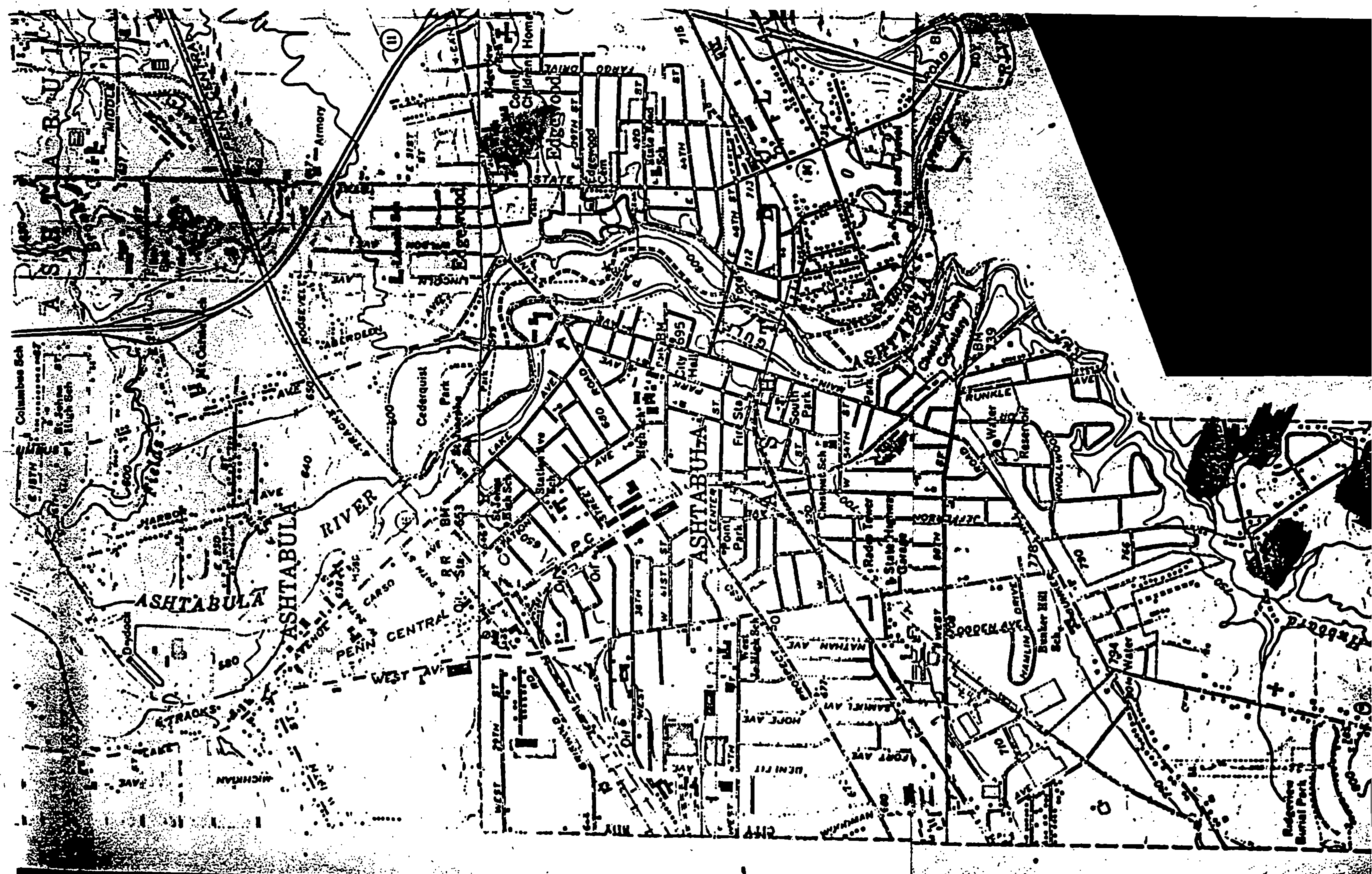
OHIO DIVISION OF GEOLOGICAL SURVEY

Permit No. 852
Permit Issued 8-17-77

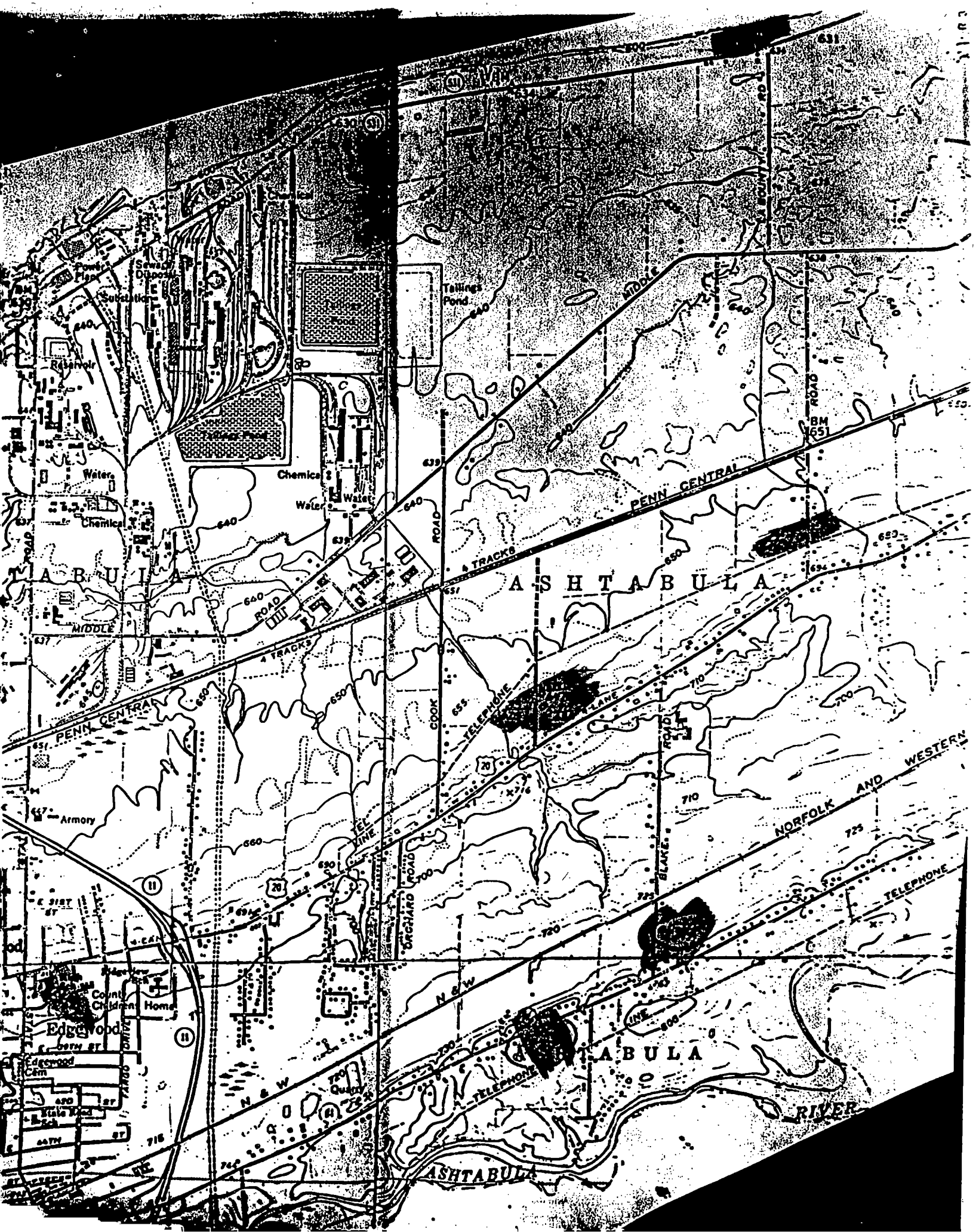
County ASHTABULA Township ASHTABULA Quadrangle Ashtabula No.
Section Lot 7(W) Tract Twp. Quarter
Measured 338' NL & 300' EL of Lot 7(W) Erie Tract, T-13R-3
20 Acres "Clinton" - Pool - R.T.
Land Owner New Jersey Zinc Co. Well No. 1 Date Commenced 10-2-77
Operator G&W Natural Resources Group Well No. Date Completed 10-8-77
Elevation Bar 645'T 655'KB Total Depth 2960' Plugged Back
Formation Drld. To Qu Prod. Form. Cl Prod. Nat.
F/W 1905 bbls wtr., & 50M# sd. Pf. (15) 2725-2794 I.P.A.F.500MCFG
Init. Rock Press.
Casing Record 8 5/8" 310', 4½" 2943' 150sks. Abandoned

Formation	Top	Bottom	Remarks	Formation	Top	Bottom	Remarks
Date: COMPLETION 3-9-78				X= 2,473,250 Y= 814,550			
Ohio shale	0	1433					
B. Lime	1433	1723					
Oriskany	1723	1762					
B. Lime	1762	2168					
Salina	2168	2297					
B. Lime	2297	2626					
Shale	2626	2690					
P. Shell	2690	2715					
Clinton	2715	2794					
Shale	2794	2960	TD				


East Ashtabula
ASHTABULA
ASHTABULA
Edgewood
Edgewood
Edgewood
Cedarquist Park
Fields
Waterworks
High Sch
Mother of Sorrows Sch
Columbus Sch
St Johns High Sch
Sewage Disposal
Reservoir
Chemical
Water
Filter Bed
Armory
Drydock
Mt Carmel Sch
City Hall
Fire Sta
Point Park
County Children Home
Edgewood Cem
ASHTABULA RIVER
PENN CENTRAL
4 TRACKS
WEST AVE
LAKE AVE
ROOSEVELT
MIDDLE
ROAD
STREET
BM 653
BM 695
519
531
11



ASHTABULA
ASHTABULA RIVER
PENN CENTRAL
WEST AVE
STATE
Edgewood
Cederquist Park
City Hall
South Park
Point Park
Columbus Sch
HARBOR
LAKE
MICHIGAN
TRACKS
CARSON
OGDEN AVE
NATHAN AVE
HOLT AVE
RUNKLE
Water Reservoir
Chestnut Grove Cemetery
Armory
Drydock


Tailings Pond
Reservoir
Water
Chemical
Sewage Disposal
Substation
Power Plant
MIDDLE ROAD
PENN CENTRAL
4 TRACKS
ROAD
BM 651
ASHTABULA
Armory
Edgewood
County Children's Home
Edgewood Cem
TELEPHONE LINE
COOK ROAD
ORCHARD ROAD
BLAKE ROAD
LANE
NORFOLK AND WESTERN
N & W
Quarry
RIVER

WELL LOG AND DRILLING REPORT

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus, Ohio 43212

PLEASE USE PENCIL OR TYPEWRITER
DO NOT USE INK.

No. 347752

County Ashtabula Township Ashtabula Section of Township

Owner Robert Fairburn Address 4815 Lake Rd. East of Ashtabula

Location of property Lake Rd., 2 mi. E. of State Rd.

CONSTRUCTION DETAILS

Casing diameter 6" O.D. Length of casing 65'

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion 9-17-65

BAILING OR PUMPING TEST

Pumping Rate 10 G.P.M. Duration of test 8 hrs.

Drawdown 170 ft. Date 9-17-65

Static level-depth to water 30 ft.

Quality (clear, cloudy, taste, odor) salty

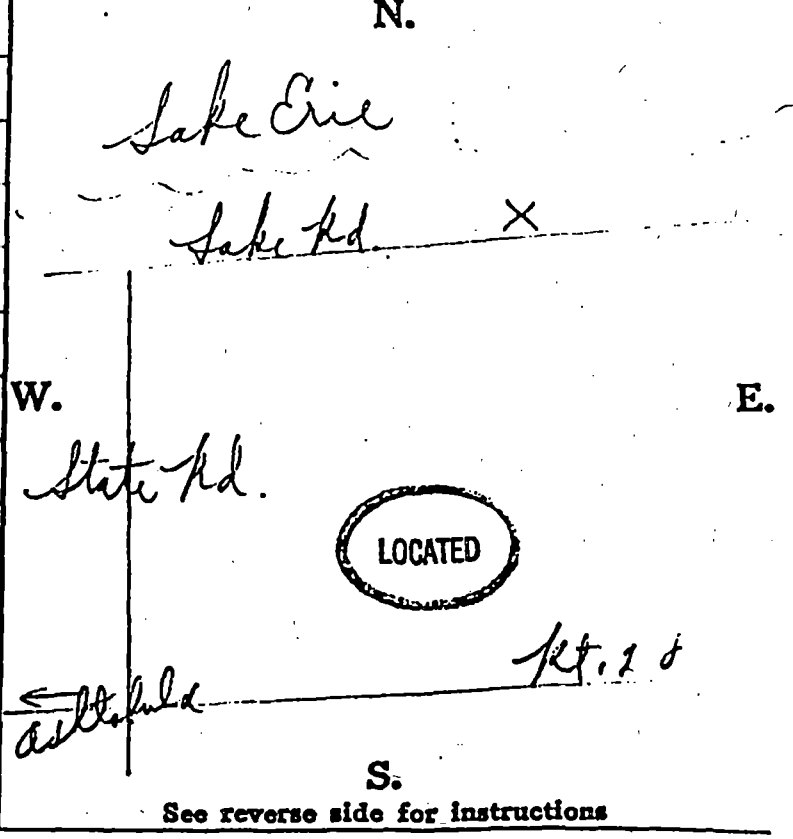
Pump installed by

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
clay	0 Feet	60 Ft.
shale	60	200

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm HAROLD INMAN WELL DRILLING RT. 2-JEFFERSON, OHIO Date

Address Signed Harold Inman

*If additional space is needed to complete well log, use next consecutive numbered form.

12

PLEASE USE PENCIL OR TYPEWRITER
DO NOT USE INK.

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus 12, Ohio

No 292523

County Ashtabula Township Ashtabula Section of Township

Owner Milton Mullen Address Howard Rd, Ashtabula

Location of property Howard Rd. ¾ to E of Rt. 46

CONSTRUCTION DETAILS

Casing diameter 6 O.D. Length of casing 22½

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion 10-16-62

BAILING OR PUMPING TEST

Pumping Rate ½ G.P.M. Duration of test 1 hrs.

Drawdown 27 ft. Date 10-16-62

Static level-depth to water 29 ft.

Quality (clear, cloudy, taste, odor) clear, good

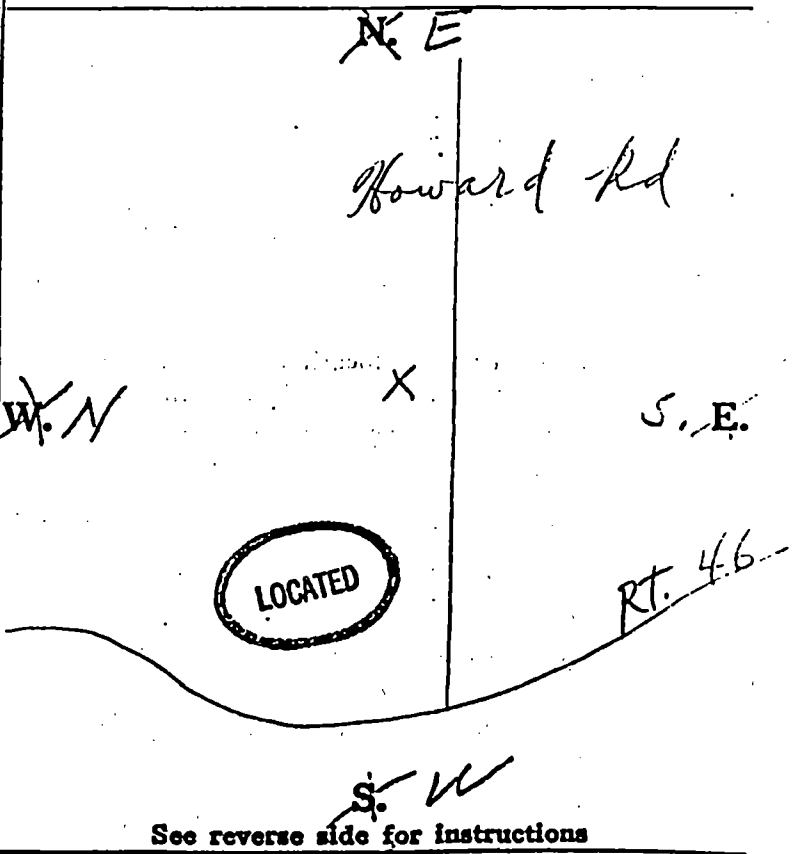
Pump installed by

WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
clay	0 Feet	16 Ft.
gravel	16	18
clay	18	21
blue shale	21	56

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm HAROLD INMAN WELL DRILLING

Address RT. 2 - JEFFERSON, OHIO

Date 1/24/63

Signed Harold Inman

11

PLEASE USE PENCIL OR TYPEWRITER
DO NOT USE INK.

of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus 12, Ohio

No. 292538

County Ashtabula Township Ashtabula Section of Township

Owner J. J. Yianna Address R.D. Mineral Springs Rd.

Location of property Mineral Springs Rd, 2/10 m. W. of Rt. 46 Ashtabula, O.

CONSTRUCTION DETAILS

Casing diameter 8 I.D. Length of casing 19

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion Nov. 15, 62

BAILING OR PUMPING TEST

Pumping Rate 2 G.P.M. Duration of test 1 hrs.

Drawdown 41 ft. Date Nov. 15, 62

Static level-depth to water 8½ ft.

Quality (clear, cloudy, taste, odor) clear, good

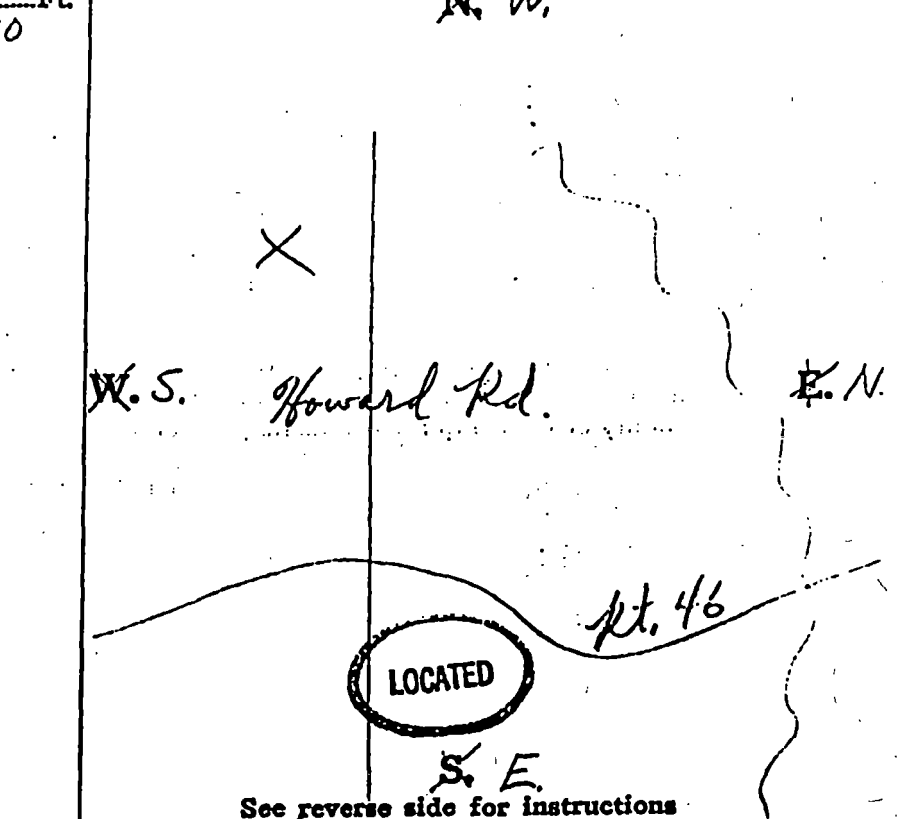
Pump installed by

WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
gravel & sand	0 Feet	15 Ft.
shale	15	50

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm HAROLD INMAN WELL DRILLING

Address RT. 2 JEFFERSON, OHIO

Date 2/11/63

Signed Harold Inman

10

PLEASE USE PENCIL OR TYPEWRITER DO NOT USE INK.

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus 12, Ohio

No 295286

County Ashtabula Township Ashtabula Section of Township

Owner Walter Chamberlin Address 5933 Washington Blvd, Ashtabula O.

Location of property Rt. 84, 2 mi. E. of State Rd.

CONSTRUCTION DETAILS

Casing diameter 6 O.D. Length of casing 61

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion 5-16-63

BAILING OR PUMPING TEST

Pumping Rate 4 G.P.M. Duration of test hrs.

Drawdown 28 ft. Date 5-16-63

Static level-depth to water 47 ft.

Quality (clear, cloudy, taste, odor) good, clear

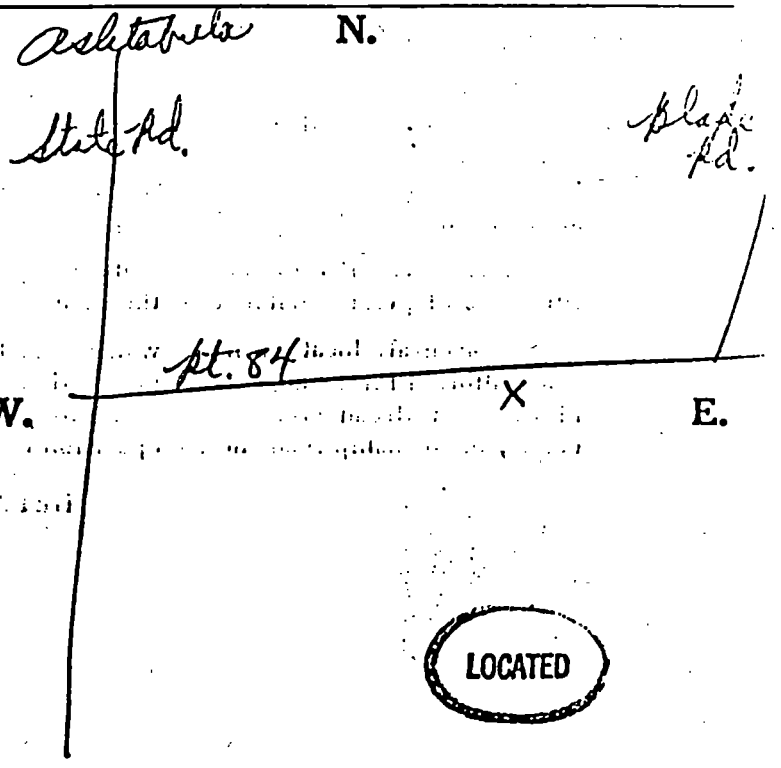
Pump installed by

WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
clay + sand	0 Feet	49 Ft.
gravel	49	52
clay	52	59
shale	59	75

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm HAROLD INMAN WELL DRILLING

Address RT. 2-JEFFERSON, OHIO

Date 12-11-63

Signed H. Inman

9

PLEASE USE PENCIL OR TYPEWRITER. DO NOT USE INK.

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus, Ohio

No. 241682

County Ashtabula Township Ashtabula Section of Township 4

Owner Gale Myers Address Euerka RD.

Location of property ½ mile south on Euerka RD.

CONSTRUCTION DETAILS

Casing diameter 5 & 4 Length of casing 17'

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion

BAILING OR PUMPING TEST

Pumping rate 60 PH. G.P.M. Duration of test 7 hrs.

Drawdown ft. Date 8/24/59

Developed capacity

Static level—depth to water ft.

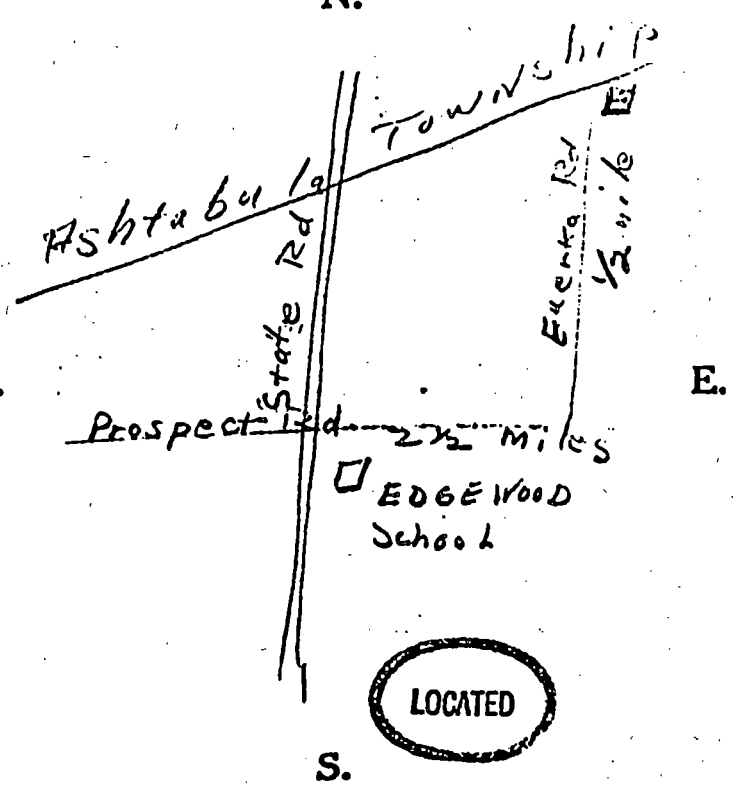
Pump installed by

WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
BLUE CLAY	0 Feet	15 Ft.
SHALE	15'	83'
WATER AT 83 Feet.		
SALT		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm PAUL E McGILL Date 8/24/59

Address Rte 2 Garrison RD. Ashtabula Signed Paul E McGill

8

WELL LOG AND DRILLING RECORD

PLEASE USE PENCIL OR TYPEWRITER. DO NOT USE INK.

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus 12, Ohio

No. 284603

County Ashtabula Township Ashtabula Section of Township

Owner Daniel Samples Address

Location of property on West side of S.11 Rd

CONSTRUCTION DETAILS

Casing diameter 8" Length of casing 19'4"

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion

BAILING OR PUMPING TEST

Pumping Rate G.P.M. Duration of test hrs.

Drawdown ft. Date

Static level-depth to water ft.

Quality (clear, cloudy, taste, odor)

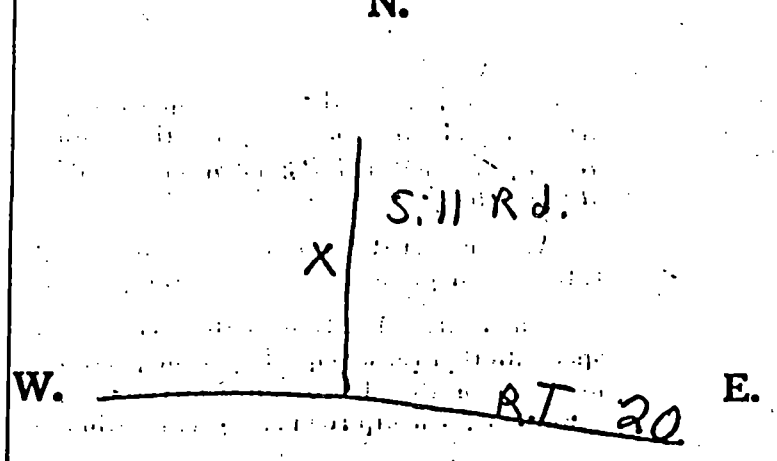
Pump installed by

WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
Clay	0 Feet	14 Ft.
Shale	14	30
WATER 25 ft		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm Paul McGill Date Aug. 20, 1962

Address RFD #2 Ashtabula, Ohio Signed Paul McGill

7

WELL LOG AND DRILLING REPORT

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus, Ohio 43212

PLEASE USE PENCIL OR TYPEWRITER
DO NOT USE INK.

No 374407

County Ashtabula Township Ashtabula Section of Township

Owner Larry Bucci Address Blake Rd, Ashtabula, O.

Location of property 0 Blake Rd., ¼ mi. N. of Rt. 84

CONSTRUCTION DETAILS

Casing diameter 8¼" I.D. Length of casing 19'

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion 4-17-67

BAILING OR PUMPING TEST

Pumping Rate 4 G.P.M. Duration of test 1 hrs.

Drawdown 43 ft. Date 4-17-67

Static level-depth to water 8 ft.

Quality (clear, cloudy, taste, odor) clear, good

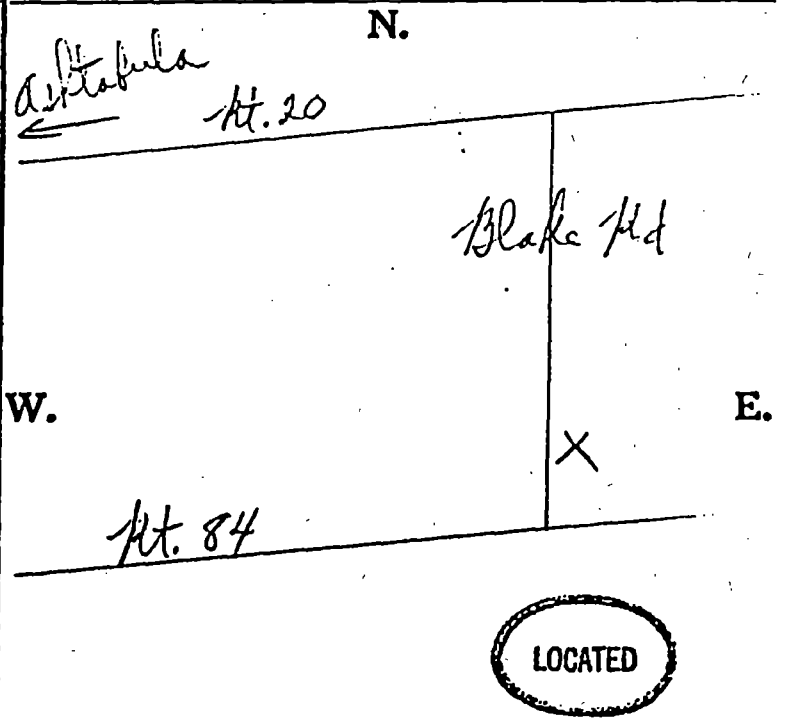
Pump installed by

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
clay	0 Feet	11 Ft.
shale	11	51

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



LOCATED

See reverse side for instructions

Drilling Firm HAROLD INMAN WELL DRILLING

Address RT. 2 JEFFERSON, OHIO

Date 12-29-67

Signed Harold Inman

*If additional space is needed to complete well log, use next consecutive numbered form.

6

PLEASE USE PENCIL OR TYPEWRITER. DO NOT USE INK.

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus, Ohio

No. 274785

County ASHTABULA Township Andover Section of Township

Owner DALE COLLESH Address TILLOTSON RD

Location of property NORTH OF RT 20

CONSTRUCTION DETAILS

Casing diameter 6" Length of casing

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion

BAILING OR PUMPING TEST

Pumping rate G.P.M. Duration of test hrs.

Drawdown ft. Date June 22

Developed capacity

Static level—depth to water 2½ ft.

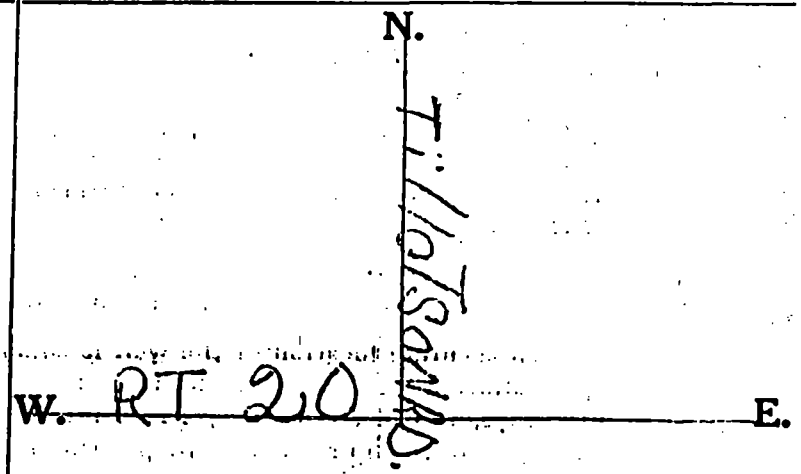
Pump installed by

WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
	0 Feet	10 Ft.
CLAY	10	25
SHALE	25	35
WATER AT 35 ft		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm Mary Rose Well Drill Date June 22, 1962

Address Harrisonville, O. Signed Mary Rose Well Drill Co

5

WELL LOG AND DRILLING REPORT

ORIGINAL

NO CARBON PAPER NECESSARY— SELF-TRANSCRIBING

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
65 S. Front St., Rm. 815 Phone (614) 469-2646
Columbus, Ohio 43215

No. 420870

County Ashtabula Township Ashtabula Section of Township

Owner Martin Higgins Address Tillotson Rd.

Location of property 1/2 mile on Tillotson Rd in Ashtabula City

CONSTRUCTION DETAILS

Casing diameter 6" Length of casing 40

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion

BAILING OR PUMPING TEST
(Specify one by circling)

Test Rate 6 G.P.M. Duration of test hrs.

Drawdown ft. Date July 10 75

Static level-depth to water ft.

Quality (clear, cloudy, taste, odor)

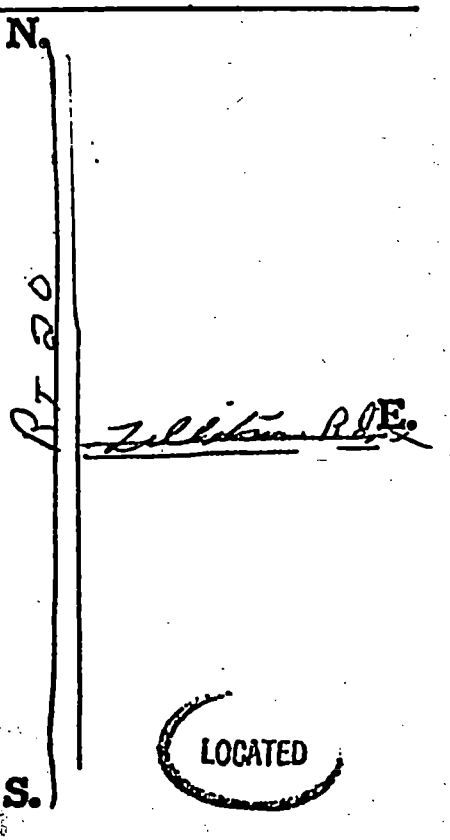
Pump installed by

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
	0 Feet	35 Ft.
clay	35	5
shale	5	40
water at 40 ft		

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



Drilling Firm Paul E McGill Date July 10 - 71

Address East Hopewell Rd. Signed Paul E McGill

*If additional space is needed to complete well log, use next consecutive numbered form.

4

PLEASE USE PENCIL OR TYPEWRITER
DO NOT USE INK

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus 12, Ohio

No 309866

County Ashtabula Township Ashtabula Section of Township

Owner Loyd Weaver Address Tillotson R.D.

Location of property ½ mi. Tillotson RD.

CONSTRUCTION DETAILS

Casing diameter 6" Length of casing 14½"
Type of screen Length of screen
Type of pump
Capacity of pump
Depth of pump setting
Date of completion

BAILING OR PUMPING TEST

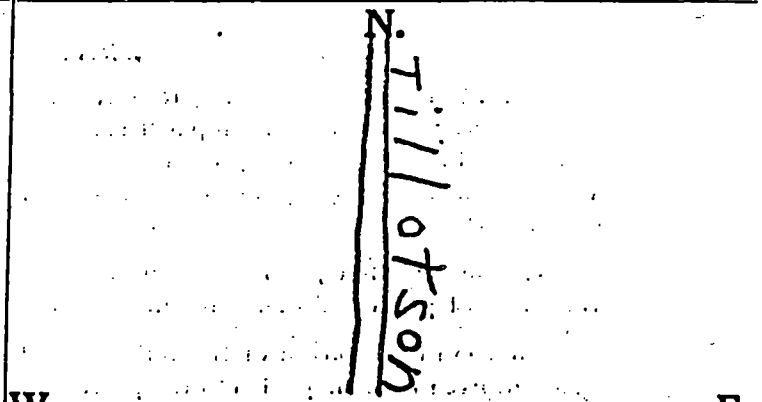
Pumping Rate 3 G.P.M. Duration of test hrs.
Drawdown ft. Date June 30, 1964
Static level-depth to water ft.
Quality (clear, cloudy, taste, odor)
Pump installed by

WELL LOG

Formations Sandstone, shale, limestone, gravel and clay	From	To
	0 Feet	6 Ft.
Clay	8	27
Shale	27	35

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



LOCATED

S.

See reverse side for instructions

Drilling Firm M.R. Paul McGill Date June 30, 1964
Address Garrisonrd. Signed Paul McGill

3

WELL LOG AND DRILLING RECORD

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus, Ohio 43212

PLEASE USE PENCIL OR TYPEWRITER
DO NOT USE INK.

No 330813

County Ashtabula Township Ashtabula Section of Township

Owner Eugene Yuter Address 811 W. 48th Ashtabula, O

Location of property Jefferson Rd. (old Rt. 46), 1 mi. S. of Rt. 84, Ashtabula

CONSTRUCTION DETAILS

Casing diameter 6" O.D. Length of casing 58'

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion 12-7-64

BAILING OR PUMPING TEST

Pumping Rate 3½ G.P.M. Duration of test 5 hrs.

Drawdown 24 ft. Date 12-7-64

Static level-depth to water 31 ft.

Quality (clear, cloudy, taste, odor) clear
slight sulphur odor

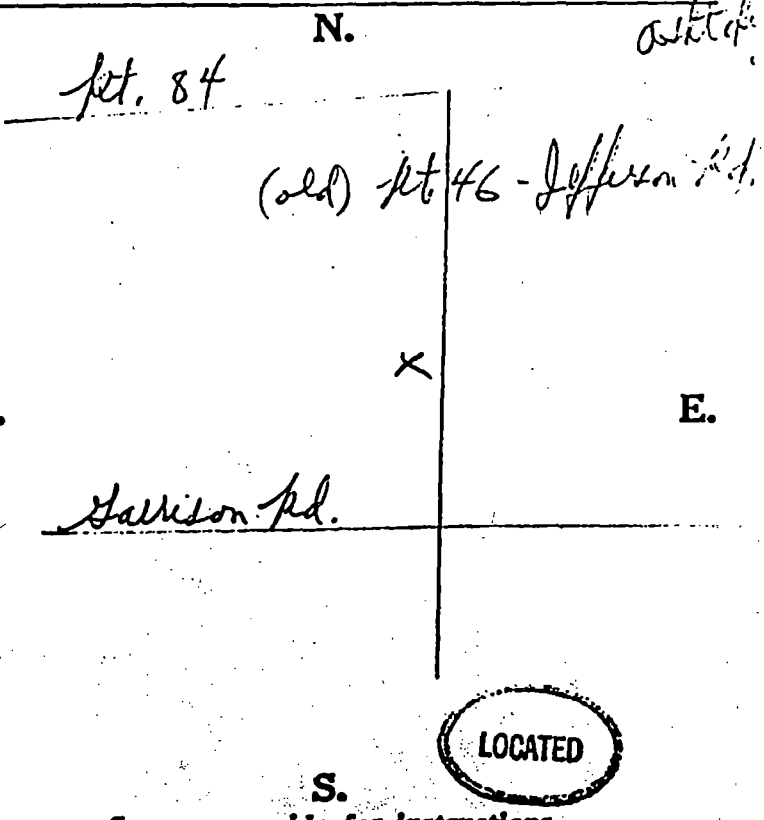
Pump installed by

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
clay	0 Feet	48 Ft.
sand	48	51
clay	51	54
gravel	54	55

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



LOCATED

See reverse side for instructions

Drilling Firm HAROLD INMAN WELL DRILLING

Address RT. 2 JEFFERSON, OHIO

Date 10/28/65

Signed Harold Inman

*If additional space is needed to complete well log, use next consecutive numbered form.

2

WELL LOG AND DRILLER'S ...

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
1562 W. First Avenue
Columbus, Ohio 43212

PLEASE USE PENCIL OR TYPEWRITER
DO NOT USE INK

No. 363017

County Ashtabula Township Ashtabula Section of Township

Owner Jos. L. McCoy Address 1823 W. 6th Ashtabula, O.

Location of property Anderson allotment, ½ mi. N. of Mineral Springs Rd.

CONSTRUCTION DETAILS

Casing diameter 8¼" I.D. Length of casing 24'

Type of screen Length of screen

Type of pump

Capacity of pump

Depth of pump setting

Date of completion 11-10-66

BAILING OR PUMPING TEST

Pumping Rate 1 G.P.M. Duration of test 5 hrs.

Drawdown 68 ft. Date 11-10-66

Static level-depth to water 2 ft.

Quality (clear, cloudy, taste, odor) clear, good

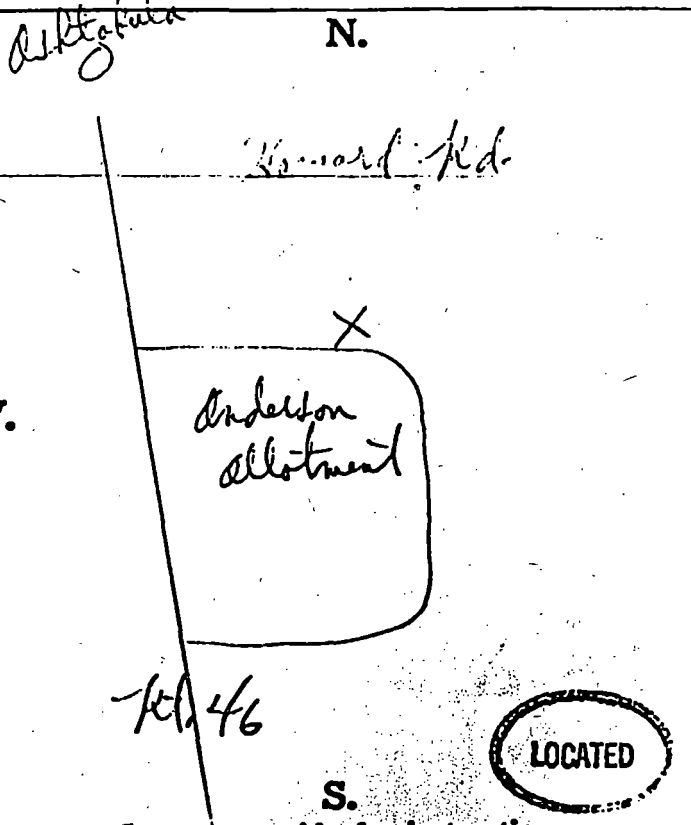
Pump installed by

WELL LOG*

Formations Sandstone, shale, limestone, gravel and clay	From	To
gravel	0 Feet	8 Ft.
clay	8	18
shale	18	70

SKETCH SHOWING LOCATION

Locate in reference to numbered State Highways, St. Intersections, County roads, etc.



See reverse side for instructions

Drilling Firm HAROLD INMAN WELL DRILLING Date 5-13-67

Address RT. 2 JEFFERSON, OHIO Signed

*If additional space is needed to complete well log, use next consecutive numbered form.

EM-CW(20)-E8

STANDARD FORM C – MANUFACTURING AND COMMERCIAL

FOR AGENCY USE

SECTION II. BASIC DISCHARGE DESCRIPTION

Complete this section for each discharge indicated in Section I, Item 9, that is to surface waters. This includes discharges to municipal sewerage systems in which the wastewater does not go through a treatment works prior to being discharged to surface waters. Discharges to wells must be described where there are also discharges to surface waters from this facility. SEPARATE DESCRIPTIONS OF EACH DISCHARGE ARE REQUIRED EVEN IF SEVERAL DISCHARGES ORIGINATE IN THE SAME FACILITY. All values for an existing discharge should be representative of the twelve previous months of operation. If this is a proposed discharge, values should reflect best engineering estimates.

ADDITIONAL INSTRUCTIONS FOR SELECTED ITEMS APPEAR IN SEPARATE INSTRUCTION BOOKLET AS INDICATED. REFER TO BOOKLET BEFORE FILLING OUT THESE ITEMS.

1. Discharge Serial No. and Name

   a. Discharge Serial No. (see instructions) — 201a: 001

   b. Discharge Name Give name of discharge, if any. (see instructions) — 201b: RMI 36" Sewer at State Road

   c. Previous Discharge Serial No. If previous permit application was made for this discharge (see Item 4, Section I), provide previous discharge serial number. — 201c:

2. Discharge Operating Dates

   a. Discharge Began Date If the discharge described below is in operation, give the date (within best estimate) the discharge began. — 202a: 50 (YR) 6 (MO)

   b. Discharge to Begin Date If the discharge has never occurred but is planned for some future date, give the date (within best estimate) the discharge will begin. — 202b: YR MO

   c. Discharge to End Date If discharge is scheduled to be discontinued within the next 5 years, give the date (within best estimate) the discharge will end. — 202c: YR MO

3. Engineering Report Available Check if an engineering report is available to reviewing agency upon request. (see instructions) — 203: X

4. Discharge Location Name the political boundaries within which the point of discharge is located.

				Agency Use
State	204a	Ohio	204d	
County	204b	Ashtabula	204e	
(If applicable) City or Town	204c	Ashtabula Township	204f	

5. Discharge Point Description
   Discharge is into (check one): (see Instructions)

Stream (includes ditches, arroyos, and other intermittent watercourses)	205a	☐STR
Lake		☐LKE
Municipal Sanitary Wastewater Transport System		☐MTS
Municipal Combined Sanitary and Storm Transport System		☐MCS

DISCHARGE SERIAL NUMBER

001

FOR AGENCY USE

Municipal Storm Water Transport System		☐ STS
Well (Injection)		☐ WEL
Other		☒ OTH
If 'other' is checked, specify	205b	36" Sewer that connects to 48" sewer with its discharge to Fields Brook.
6. Discharge Point — Lat/Long Give the precise location of the point of discharge to the nearest second. Latitude	206a	41 DEG 54 MIN 1.63 SEC
Longitude	206b	80 DEG 46 MIN 21.37 SEC
7. Discharge Receiving Water Name Name the waterway at the point of discharge.(see instructions)	207a	Fields Brook
If the discharge is through an outfall that extends beyond the shoreline or is below the mean low water line, complete Item 8.	207b	For Agency Use: Major / Minor / Sub
	207c	
		For Agency Use: 303e
8. Offshore Discharge a. Discharge Distance from Shore	208a	_____ feet
b. Discharge Depth Below Water Surface	208b	_____ feet
9. Discharge Type and Occurrence a. Type of Discharge Check whether the discharge is continuous or intermittent. (see instructions)	209a	☒ (con) Continuous ☐ (int) Intermittent
b. Discharge Occurrence Days per Week. Enter the average number of days per week (during periods of discharge) this discharge occurs.	209b	7 days per week
c. Discharge Occurrence —Months If this discharge normally operates (either intermittently, or continuously) on less than a year-around basis (excluding shutdowns for routine maintenance), check the months during the year when the discharge is operating. (see instructions)	209c	☐ JAN ☐ FEB ☐ MAR ☐ APR ☐ MAY ☐ JUN ☐ JUL ☐ AUG ☐ SEP ☐ OCT ☐ NOV ☐ DEC
Complete Items 10 and 11 if "intermittent" is checked in Item 9.a. Otherwise, proceed to Item 12.		
10. Intermittent Discharge Quantity State the average volume per discharge occurrence in thousands of gallons.	210	_____ thousand gallons per discharge occurrence.
11. Intermittent Discharge Duration and Frequency a. Intermittent Discharge Duration Per Day State the average number of hours per day the discharge is operating.	211a	____ hours per day
b. Intermittent Discharge Frequency State the average number of discharge occurrences per day during days when discharging.	211b	____ discharge occurrences per day
12. Maximum Flow Period Give the time period in which the maximum flow of this discharge occurs.	212	From ____ (month) to ____ (month)

DISCHARGE SERIAL NUMBER
001

FOR AGENCY USE

13. Activity Description Give a narrative description of activity producing this discharge.(see instructions)

213a

Manufacture of Metallic Sodium and Chlorine by electrolysis of a fused sodium chlorine in a "Downs" type cell.

14. Activity Causing Discharge For each SIC Code which describes the activity causing this discharge, supply the type and maximum amount of either the raw material consumed (Item 14a) or the product produced (Item 14b) in the units specified in Table I of the Instruction Booklet. For SIC Codes not listed in Table I, use raw material or production units normally used for measuring production.(see instructions)

a. Raw Materials

214a	SIC Code (1)	Name (2)	Maximum Amount/Day (3)	Unit (See Table I) (4)	Shared Discharges (Serial Number) (5)
	2819	Salt	220	K-1	None

b. Products

214b	SIC Code (1)	Name (2)	Maximum Amount/Day (3)	Unit (See Table I) (4)	Shared Discharges (Serial Number) (5)
	2819	Sodium	77.5	K-1	None
	2819	Chlorine	120	K-1	None

DISCHARGE SERIAL NUMBER

001

FOR AGENCY USE

15. Waste Abatement

a. Waste Abatement Practices
Describe the waste abatement practices used on this discharge with a brief narrative. (see instructions)

215a

Narrative: RMI has a wastewater treatment system consisting of a lime neutralization facility, a proprietary chlorine recovery facility, a proprietary catalytic decomposition unit, and a series of five settling ponds. Treated effluent from this system is mixed with non-contact cooling water prior to discharge. Solid waste is disposed of in a state-approved land fill.

b. Waste Abatement Codes
Using the codes listed in Table II of the Instruction Booklet, describe the waste abatement processes for this discharge in the order in which they occur if possible.

215b

(1) ESEGRE,	(2) DCHANG,	(3) RECOVE,
(4) RECYCL,	(5) LOCALS,	(6) OMONIT,
(7) PSEDIM,	(8) CNEUTR,	(9) CFLOCC,
(10) SLANDD,	(11) SAEROB,	(12) MADSOR,
(13) ,	(14) ,	(15) ,
(16) ,	(17) ,	(18) ,
(19) ,	(20) ,	(21) ,
(22) ,	(23) ,	(24) ,
(25) .		

Re: Ohio EPA Permit No. E 312 *AX

RMI Company
Sodium and Chlorine Plant
46 State Road
Ashtabula, Ohio 44004

August 26, 1980

Attention: Mr. E. R. Toth, Jr.

Gentlemen:

Please find enclosed an industrial status report discussing the survey that was conducted at your facilities on April 29 and 30, 1980.

We wish to express our appreciation for the courtesy and cooperation which was extended to us during this survey.

If we can be of further assistance, please contact our office.

Yours truly,

William T. Skowronski

William T. Skowronski, P.E.
Group Chief

REB:mjo

Enclosure

State of Ohio Environmental Protection Agency
Northeast District Office
2110 E. Aurora Road, Twinsburg, Ohio 44087 • (216) 425-9171

James A. Rhodes, Governor
James F. McAvoy, Director

INDUSTRIAL COMPLIANCE MONITORING INSPECTION REPORT

RMI Company
Sodium and Chlorine Plant
46 State Road
Ashtabula, Ohio 44004

Prepared By

Robert E. Buda
Office of Wastewater
Industrial Wastewater Group
Northeast District Office

August 26, 1980

FACT SHEET

Type of Inspection:	Compliance Sampling
Date of Inspection:	April 29 and 30, 1980
Date of Sampling:	April 29 and 30, 1980
Date of Last Inspection:	August 22, 1979
Type of Last Inspection:	Compliance Evaluation Inspection

Entity	Facility Representatives
RMI Company Sodium and Chlorine Plant 46 State Road Ashtabula, Ohio 44004	Bert Bertea, General Manager, Ashtabula Operations Lawrence S. Hanek, Plant Manager Telephone: (216) 997-5141

Responsible Official:

E. R. Toth, Jr., Vice-President of Operations Telephone: (216) 652-9951

NPDES Permit

Ohio EPA Permit Application No. E 312 *AX
U.S. EPA No. OH 0002313
No effective permit

Outfall Data

Monitoring Station:	E 312001
Type of Wastewater:	Process and Cooling
Flow, Average:	6.5 MGD
Receiving Waters:	Storm sewer to Fields' Brook
Parameter Monitored:	Total Alkalinity Chloride Total Solids Total Suspended Solids Total Settleable Solids pH Flow

Participants

Ohio EPA, Northeast District Office

William T. Skowronski, Group Chief, Industrial Wastewater

Robert Wysenski, Group Chief, Surveillance and Laboratory Services

Robert E. Buda, Environmental Scientist, Industrial Wastewater

Permittee:

O. Bertea, General Manager, Ashtabula Operations

Lawrence S. Hanek, Plant Manager

SUMMARY

Currently, the RMI Company, does not have an effective NPDES permit, but is presently negotiating a NPDES permit with the OEPA. The purpose of this survey is to facilitate such negotiations.

FACILITY DESCRIPTION

The RMI Company, Sodium and Chlorine Plant, produces metallic sodium and chlorine by the electrolysis of sodium chloride (NaCl) using the Downs cell process. The RMI facility is located in Ashtabula County, on State Road, east of the intersection of State Road and East Sixth Street. This site is on the watershed of Fields Brook, a tributary to the Ashtabula River.

The RMI Company has installed three different wastewater treatment systems. These consist of a lime addition facility and a series of five settling ponds, a chlorine gas recovery facility, and a facility for catalytic decomposition of hypochlorite.

In the first system, contaminated chlorine gas is reacted with lime to prevent its release to the atmosphere. The reaction produces a solution of calcium hypochlorite and calcium chloride which is eventually discharged into holding ponds. Contaminated chlorine gas results from separate operations. Gas from the first operation is termed "off gas" and results from chlorine which escapes from the cells when they are being worked on or are not operating properly. This gas stream has a high volume of air, dust and miscellaneous impurities. Chlorine recovery in a pure enough state is not economical.

The second source of contaminated chlorine gas is called "sniff" and "tail" gas. Sniff gas is residual chlorine in empty tank cars that must be removed before refilling. Tail gas is chlorine which remains from the liquefaction process.

The chlorine recovery process involves the alternate absorption-desorption of chlorine on a bed of silica gel in a cyclic process. The system consists of

a series of tanks, heat exchanges, a two stage vacuum pump, connecting piping, controls and miscellaneous apparatus. It is designed to handle all of the tail and sniff gas normally expected when the plant facilities are operating at their designed capacity. In this way 90-96 percent of the elemental chlorine contained in the tail and sniff gas will be recovered and recycled to the plant chlorine liquefaction system. The residual air stream leaving the recovery facilities contains a small amount of chlorine and is routed to the existing lime neutralization facilities where it is treated to prevent air pollution.

The following description serves to describe the basic function of the above system: Tail and sniff gas enter a guard tank which contains a shallow bed of silica gel. The primary purpose of this tank is to trap impurities which might enter the gas stream that could be detrimental to the absorption-desorption process in the tanks that follow. The cleaned gas stream enters an absorber after passing through a gas chiller. As the gas stream passes downward through the gel in the tower, the chlorine is preferentially absorbed. The silica gel is an amorphous form of pure silica which, under the proper physical conditions, has an affinity for a number of gasses including chlorine. An inherent property of the gel is that for any given amount of a particular gas retained by the gel, the amount of gas retained is directly proportional to the partial pressure of the gas in question, and is inversely proportional to the temperature of the system. When a gas molecule is absorbed, its latent heat of condensation plus the additional heat released by the action of the attractive molecular forces causes the bed to warm up until a point is reached at which no further absorption occurs. The greater the partial pressure of chlorine in contact with the gel, the more chlorine the gel can hold at any given temperature. The undesired diluent, such as air, is preferentially displaced by the chlorine and passes out of the vessel of the disposal system while the chlorine remains behind bound in the gel.

Conversely, as the gas space is evacuated, the partial pressure of the chlorine in the gas space is reduced and the gel begins to give up the absorbed chlorine in an attempt to reestablish equilibrium. This reaction continues until a condition of equilibrium is reached. At this time the incoming gas is rerouted to a second absorber and the original absorber is placed on the chlorine recovery cycle. In this portion of the recovery cycle, heat is absorbed from the surroundings in order to vaporize the chlorine and the bed cools, theoretically back to the temperature existing at the start of the absorption process. The pressure in the original tank is reduced by the use of a 2-stage vacuum pump. This cycle is controlled on a timed basis.

The above mentioned reactions take place in towers that are separated into two sections so that the gas can be put through a cooler in order to improve the efficiency of the system as the gas passes from one section of the tower to the other. The stripped gas stream leaving the absorber flows to the neutralizing system. The chlorine gas released is routed to the existing plant liquefaction system where it is recovered as a marketable product. The operation of this system continues in this method, shifting from tank to tank on a pre-selected schedule. A terminal filter is present to catch any gel particles which may be carried out with the gas stream.

The third pollution control system consists of a facility for the catalytic decomposition of hypochlorite. The hypochlorite is generated by reacting waste chlorine gas with lime in the neutralization facility. The waste chlorine gas originates as the stripped gas stream described above and as "off gas" from the Downs cells during maintenance operations or malfunctions.

The hypochlorite wastes are collected in a two-section settling pond and pumped continuously to a heated, agitated reactor containing cobalt hydroxide as a

catalyst. Oxygen is released during the reaction and the hypochlorite waste is reduced to a chloride salt as illustrated:

$$Ca(OCl)_2 \xrightarrow{Catalyst} CaCl_2 + O_2$$

Effluent from the first reactor flows by gravity to a second reactor for additional reaction time. The second reactor discharges to a sealing tank where a flocculating agent is added to aid in precipitating any catalyst particles that are carried over. The catalyst particles are recycled to the first reactor. The clarified wastewater flows to a surge tank and subsequently to the third settling pond in the five pond holding and settling system.

The clarified wastewater, often passing through the remaining ponds, is then discharged to the main plant sewer and then to Fields Brook.

THE SAMPLING PROGRAM

On April 29 and 30, 1980, personnel from the Ohio EPA and RMI Company, Sodium and Chlorine Plant, met for facility review and for sampling of the company's outfall E 312001. Residual chlorine was tested in the field by the OEPA using an amperometric titrator; RMI utilized the DPD method. OEPA installed a Manning automatic sampler at the point where the various effluent streams meet prior to being discharged to a storm sewer. This point designated E 312601 is not considered by RMI to be representative of their discharge. They believe that proper mixing of the various effluent streams has not occurred at this point. The sampling device was set to sample 300 ml, once an hour, for a twenty-four hour period. Samples were iced during compositing and proper preservatives were added after the samples were split with RMI.

The RMI Company utilizes a sampler that can be programed to collect samples on an hourly basis and at various amounts. The permittee now samples at an underground point designated E 312001. It is at this point that the storm sewer from RMI's property joins the storm sewer that runs along State Road. The effluent is pumped back to the laboratory and deposited into uncovered plastic bottles. These samples are not refrigerated during compositing. Samples are manually composited upon completion of the collecting period. We note that a refrigerated automatic sampler has been purchased by RMI and was installed the beginning of May 1980.

Additionally, a grab sample was taken of an unnamed tributary of Fields Brook which drains an area including a coal pile area belonging to CEI and RMI's solid waste disposal site. This station has been designated E 312002.

All samples were split with the RMI Company and the OEPA.

DISCUSSION OF RESULTS

On the following pages (Tables I-III) is a summary of the analytical results of the Compliance Sampling that was done on April 29 and 30, 1980. The Ohio EPA samples were analyzed in the laboratories and by the personnel of the Ohio Department of Health. The RMI Company had their samples analyzed at the RMI laboratory located at the Sodium and Chlorine Plant.

The analytical results obtained by the RMI Company and the OEPA were fairly consistent for those parameters that were analyzed by both entities. The exception was pH. However, subsequent to this sampling, the OEPA has split samples with the entity. The results of the analysis of these samples are similar. OEPA does not believe that further action is necessary.

The OEPA chose to have their samples analyzed for parameters other than those normally monitored by RMI. These were mainly heavy metals.

CONCLUSIONS

Since the facility does not have an effective NPDES permit, a determination on compliance has not been made. However, the information gathered in the survey will be used in negotiating a permit with the company.

TABLE I

Concentrations Outfall E 312001

Parameters	Units	OEPA Compliance Monitoring Value	RMI Value
pH	S.U.	7.3	8.15
Total Alkalinity	mg/l	---	86
Total Hardness	mg/l	216	---
Total Suspended Solids	mg/l	29	25
Total Dissolved Solids	mg/l	740	724
Total Chromium	ug/l	30	---
Total Copper	ug/l	90	---
Total Iron	ug/l	1620	---
Total Lead	ug/l	18	---
Total Mercury	ug/l	1.1	---
Total Zinc	ug/l	60	---
Phenol	ug/l	4	---
Total Settleable Solids	ml/l	---	.05

TABLE II

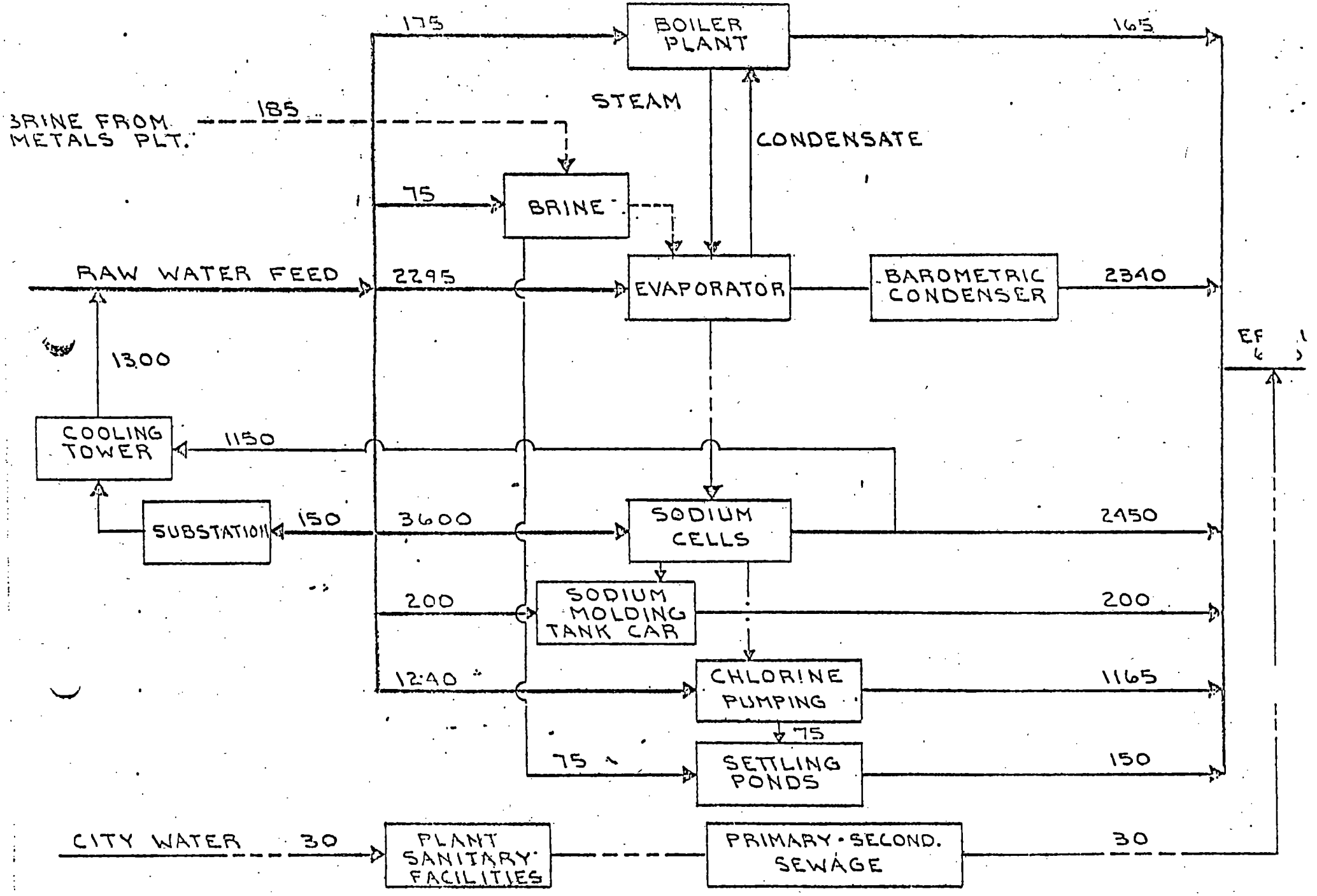
Concentrations Outfall E 312601

Parameters	Units	OEPA Compliance Monitoring Value	RMI Value
pH	S.U.	7.2	8.0
Total Alkalinity	mg/l	---	93
Total Hardness	mg/l	266	---
Total Suspended Solids	mg/l	38	38
Total Dissolved Solids	mg/l	1012	890
Total Chromium	ug/l	30	---
Total Copper	ug/l	40	---
Total Iron	ug/l	1500	---
Total Lead	ug/l	16	---
Total Mercury	ug/l	0.5	---
Total Zinc	ug/l	30	---
Phenol	ug/l	6	---
Total Settleable Solids	mg/l	---	0.5
Total Residual Chlorine 4-29-80	mg/l	0.5	0.4
4-30-80	mg/l	0.5	0.3

TABLE III

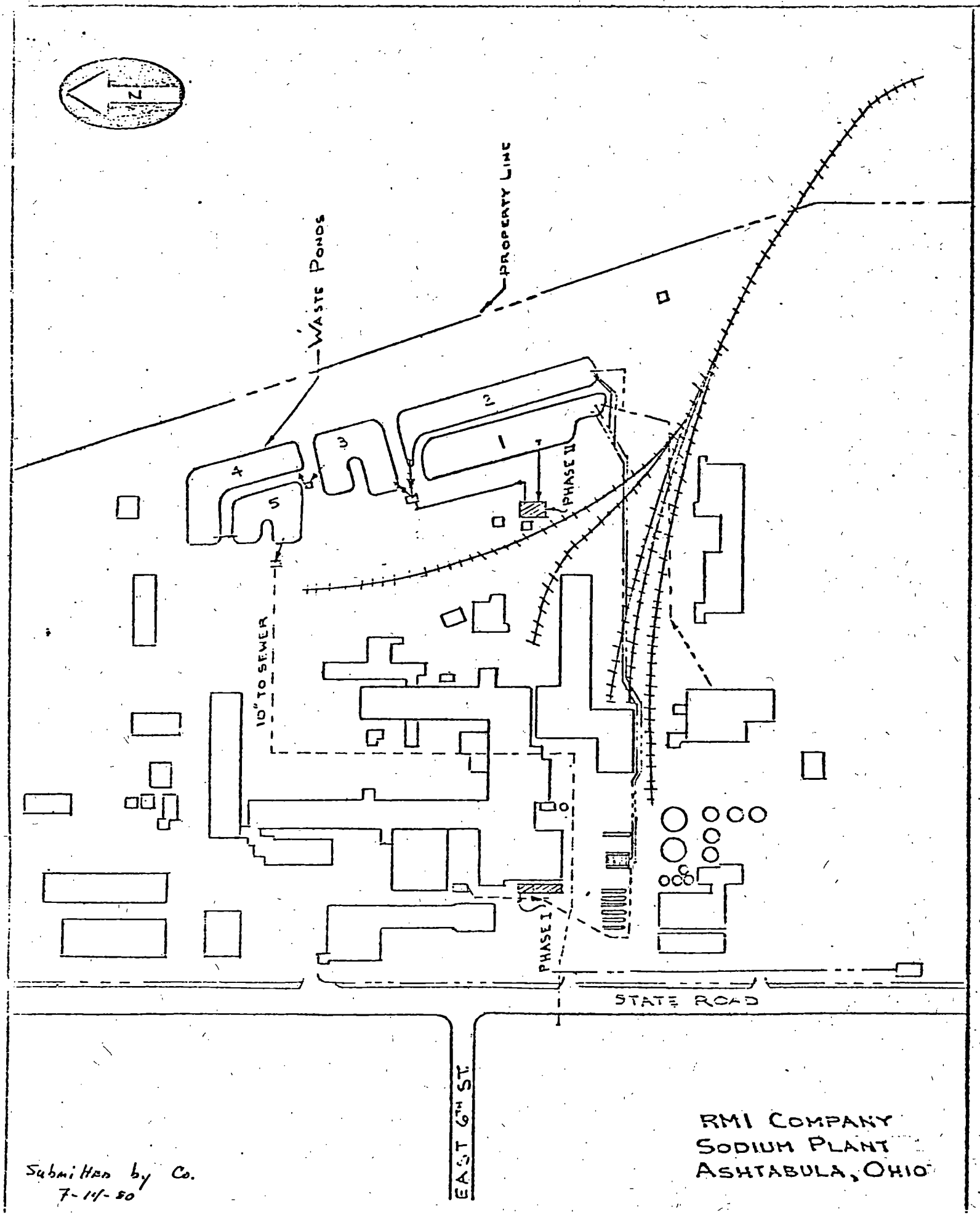
Concentrations Outfall E 312002

Parameters	Units	OEPA Compliance Monitoring Value	RMI Value
pH	S.U.	3.0	3.47
Total Hardness	mg/l	5500	---
Total Acidity	mg/l	---	353
Total Dissolved Solids	mg/l	16,488	---
Total Solids	mg/l	---	16,488
Total Chromium	ug/l	30	---
Total Copper	ug/l	120	---
Total Iron	ug/l	30,500	87,000
Total Manganese	ug/l	7,200	---
Total Mercury	ug/l	1.7	---
Total Zinc	ug/l	600	---
COD	mg/l	630	---



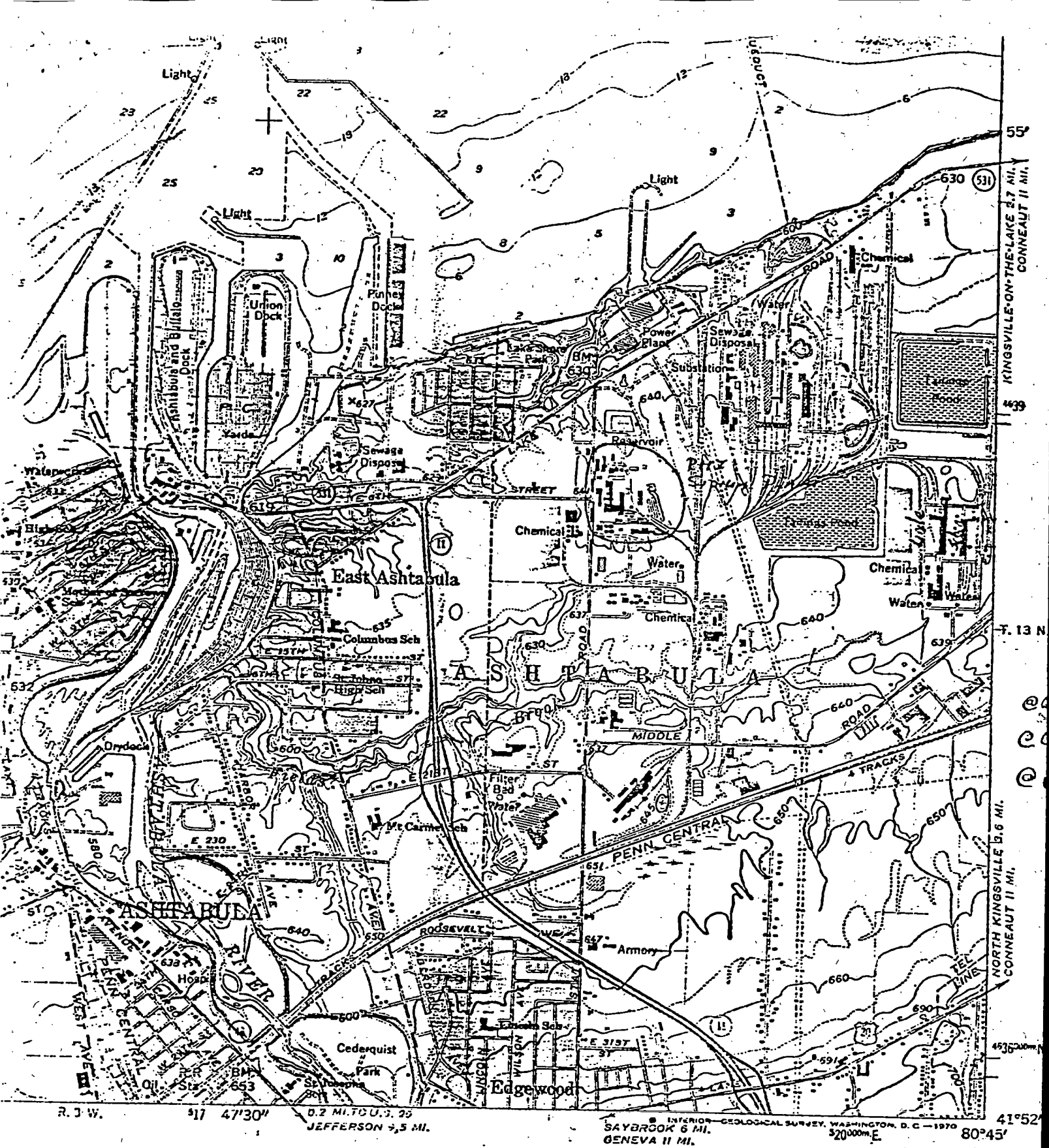
-ALL FIGURES x1000 G.P.D.

RMI - SODIUM PLANT
WATER USAGE FLOW
1/24/80



RMI COMPANY
SODIUM PLANT
ASHTABULA, OHIO

Submitted by Co.
7-14-50



1 MILE

6000 7000 FEET

1 KILOMETER

WATER 586.6 FEET

STANDARDS

OHIO

QUADRANGLE LOCATION

ROAD CLASSIFICATION

Medium-duty _____ Light-duty _____

Unimproved dirt .....

U.S. Route ◯ State Route

Heavy-duty _____

ASHTABULA NORTH, OHIO

NE/4 ASHTABULA 15' QUADRANGLE

N4152.5—W8045/7.5

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C.—1970

RMI TITANIUM

RMI Company

P. O. BOX 269
1000 WARREN AVENUE
NILES, OHIO 44446
216/652-9951 TWX 810-436-2600

May 1, 1980

CERTIFIED MAIL

Mr. Ralph W. Everett
Wastewater Permits and Compliance
Central District - Ohio EPA
369 East Broad Street
Columbus, OH 43215

Dear Mr. Everett:

Transmitted herewith is an NPDES Application for Permit to Discharge Wastewater from the RMI Company Sodium Plant at Ashtabula, Ohio.

This application is being submitted in accordance with discussions held in the Ohio EPA Columbus office on April 22, 1980, with representatives of the Wastewater Division.

Very truly yours,

E R Toth, Jr.

E. R. Toth, Jr.
Vice President-Operations

Attachment

cc: Mr. William Skowronski (W/Attachment)
Northeast District Office
Ohio EPA
Twinsburg, OH 44087

Mr. R. E. Phelps
Division of Industrial Wastewater
Ohio EPA
Columbus, OH 43215

April 25, 1980

Narrative Description
(As Outlined In Section 3745-27-09 (J) (2) Of The Ohio Administrative Code)

Solid Waste Disposal Facility
RMI Sodium Plant
Ashtabula, Ohio

It is proposed to construct two parallel holding pits at the RMI Company Sodium Plant as shown on drawing 15-1068-0, copy enclosed. These pits will be constructed one at a time. The second pit will be opened when the first is filled and closed.

The overall dimensions of these pits will be approximately 100' x 400' to base of dikes and will be 32'-0" deep as measured from top of dike. The maximum depth of the pit was determined from contact with shale.

There is a surface drainage ditch in the area of the proposed site which will be relocated to eliminate any possible convergence of the drainage water with the deposited solid waste.

The material to be deposited at the waste disposal facility will be transported to the site in a two (2) ton GMC Dump Truck weighing 12,000 lbs. The truck will ascend the ramp at the north end of pit and deposit the load being carried. The material will be spread and compacted with a D-6 Bulldozer weighing 18,280 lbs. The units will also be used for the covering operation.

There are no odor, noise, litter or leachate problems to overcome.

The types of wastes to be deposited and the approximate weekly quantities are shown on the attached sheet.

The pits will be closed with a two foot layer of dirt and clay, bringing the pit elevation to the top of the dike, and then seeded with rye grass.

Types of Waste to be Deposited from the RMI Company Sodium Plant

I. Brick, "speedy-dri", NaCl, dirt — 60 tons/week

II. Salt settlings from T Tanks — 28,000 lbs/week

a) $BaSO_4$
b) $CaSO_4$
c) NaCl
d) Fe

III. Dissolver sludge — 1,500 lbs/week

a) NaCl
b) Dirt

Types of Waste to be Deposited from the RMI Company Metals Reduction Plant

I. Slag and ashes — 230 lbs/week

a) Na_2O
b) TiO_2
c) Fe

II. Reducer product from cleaning reducer and vent seals — 290 lbs./week

a) $TiCl_2$
b) NaCl

III. Oil-soaked spalt from chipping area clean up — 40 lbs./week

a) Oil
b) NaCl
c) Ti

IV. Furnace refractory — 770 lbs./week

a) Alumina plastic refractory
80% aluminum
20% silica

V. Oil-Dri — 100 lbs./week

Ohio EPA

[illegible]

[illegible], 1980

[illegible] Toth
Vice President [illegible]
RMI Company
[illegible] State Road
Ashtabula, Ohio 4400[illegible]

Dear Mr. Toth:

Deborah Berg and I inspected the proposed waste disposal site at the RMI Sodium Plant in Ashtabula [illegible] 28, 1980. We found that large amounts of waste materials had been improperly disposed of near the proposed site. Proper closure of this site will be a precondition for operation of the proposed facility.

We are concerned about the siting of the proposed facility, since the area appeared to be swampy and a stream runs close to the perimeter of the proposed pits. Therefore, we request submittal of detailed plans as described in ORC 3745-26-06 and a Permit to Install application as required by ORC Chapter 3745-31.

Copies of the subject regulations and an application for a Permit to Install have been enclosed for your convenience.

Please contact me if you have any questions.

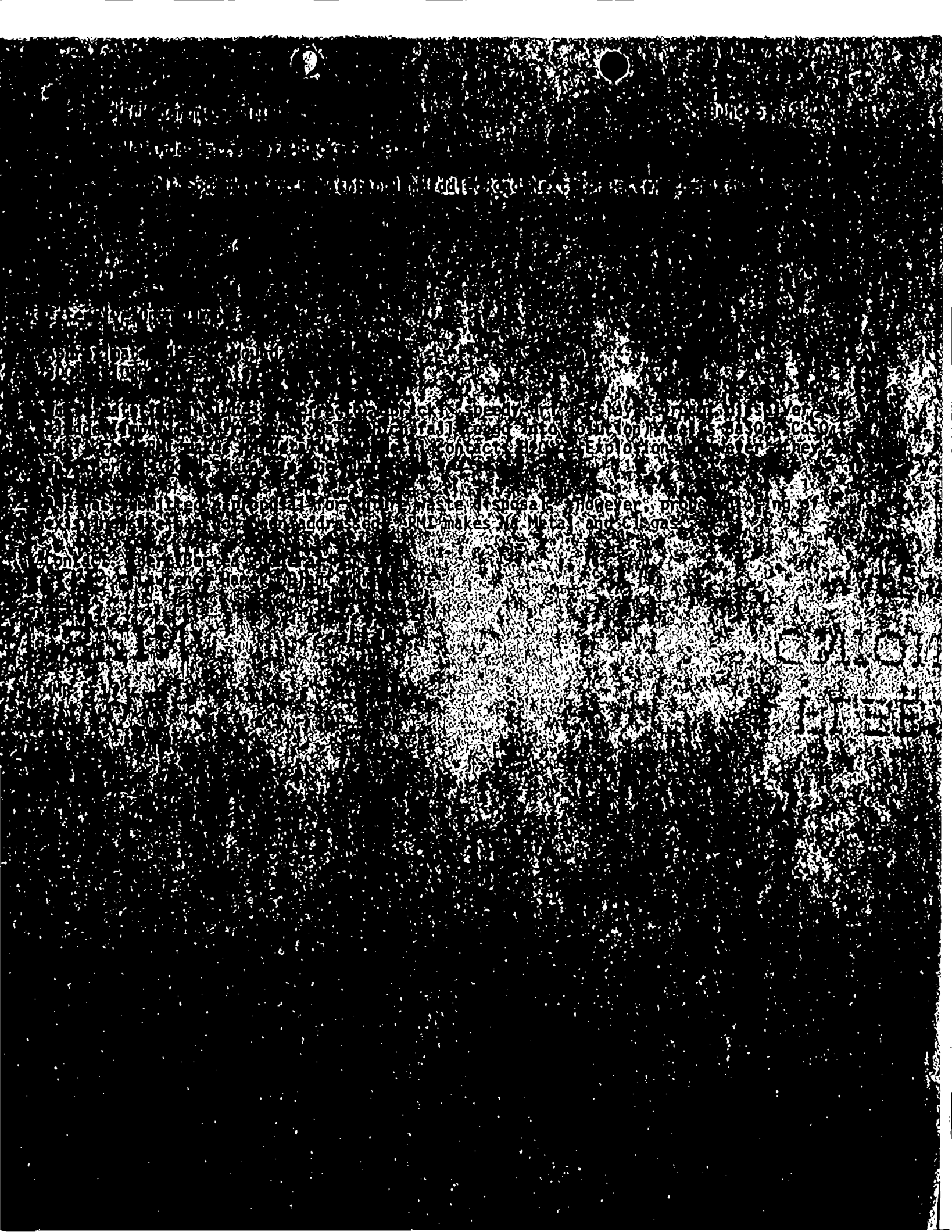
Yours truly,

Melinda [illegible]
Solid Waste Scientist
Office of Land Pollution Control
Northeast District Office

[illegible]

State of Ohio Environmental Protection Agency
Northeast District Office
2110 E. Aurora Road, Twinsburg, Ohio 44087 (216) 425-9171

James A. Rhodes, Governor
James F. McAvoy, Director



May 28, 1980
10:00 AM

RMI Na Plant

RMI	OEPA
Bert Berteen - Gen Mgr.	Melinda Becker
Lawrence Hanek - Pl. Mgr.	Debbie Berg
George Halkio - Chief Eng.
Bernie Wilken's - Corp. Eng.

Subject - inspect site for landfill proposal - Wastes from Na + Metals Reduction Plant

Flow Chart Na Plant; Products Na metal, Cl gas
Rock salt + Salt Brine → Refined Brine tank → NaCl → Downs electrolytic cell (steel, graphite) → Cl gas + Na Metal.

By product: $BaSO_4$
(Dissolver sludge)
Wastes: $CaSO_4$, insoluble impurities in Rock salt, Refractory Brick in cell, speedy dry clay absorbant, gunnite ... Salt seedlings from T. tanks
$BaSO_4$, $CaSO_4$, NaCl, Fe ... — (Allegedly) no Na Metal. Na Metal explodes when contacted w/ water.

Flow: Titanium Plant

Spall (titanium sponge + salt) + Na_2O + $TiCl_4$ → TiO_2 + Salt brine

Wastes: (To Proposed Land fill)

Hydraulic oil antamin- in spall, Na_2O, TiO_2, Fe, $TiCl_4$, NaCl, Aluminum Refrastory

Other Wastes

Waste oil going out

gear box oil, heat transfer oil (No PCB's) → barrel → heat greenhouse (didn't know which one)

Sludges → Kodak

Asbestos - presently being stored. - Some of this waste is Trench Asbestos cement.

Proposal 2 pits - 100' x 400' x 32' deep

Each pit to have a lifetime ≈ 10 years -

dig one pit; 8th year, start digging second pit.

Site Evaluation

Proposed site is in S.W. Quadrant of Na Plant property. A large amount of this material has already been dumped. A large ridge of waste material borders N.W. sides of the proposed land fill. This ridge is quite extensive. (≈300' x 1,000 x 20' high) it has not been seeded. A stream runs through the proposed site. The stream was bright red - possible source of this red colored contamination could be CEI's coal pile but could also be from RMI's plant. The ground was swampy at the proposed site. No test borings were conducted.

Recommendation:

1. RMI should either close existing dumps or get an operating license. 241 cover requirements should be enforced if closure opted.
2. Extent of stream rerouting should be clearly defined.
3. We may wish to require soil borings
   1. Possibility of Na moving into landfill
   2. danger of explosion
   3. what happens to water that collects

B. Monthly reports to the Ohio EPA shall contain the following reporting codes and units for sewage treatment outfalls:

1. For days when the facility is closed (e.g. weekends, holidays) and has no waste input, report "an" on the report form.

2. Flow may be estimated

3. For Turbidity, Odor, and Color report number between 0 and 4 from table below. Interpolate between the descriptive phrases. These parameters shall have a "~~daily~~ WEEKLY" sampling frequency.

No.	Severity Desc.	Turbidity	Odor	Color
0	None	Clear	None	Colorless
1	Mild			
2	Moderate	Light Solids	Musty	Grey
3	Serious			
4	Extreme	Heavy Solids	Septic	Black

C. "This permit may be modified, or, alternatively, revoked and reissued, to comply with any applicable effluent limitation issued pursuant to the order the United States District Court for the District of Columbia issued on June 8, 1976, in Natural Resources Defense Council, Inc. et. al. v. Russell E. Train, 8 ERC 2120 (D.D.C. 1976), if the effluent limitation so issued:

(1) is different in conditions or more stringent than any effluent limitation in the permit; or

(2) controls any pollutant not limited in the permit."

PART I, B. - ADDITIONAL MONITORING REQUIREMENTS (con't)

1. Influent Monitoring. The permittee shall monitor the ~~treatment work's influent wastewater~~ intake water at Station Number [redacted] and report to the Ohio EPA in accordance with the following table. Samples of influent used for determination of net values or percent removal must be taken the same day as those samples of effluent used for that determination. SEE PART II, OTHER REQUIREMENTS, for location of influent sampling.

EFFLUENT CHARACTERISTIC			MONITORING REQUIREMENTS	
REPORTING Code	UNITS	PARAMETER	Measurement Frequency	Sample Type

OHIO ENVIRONMENTAL PROTECTION AGENCY

TELEPHONE MEMORANDUM

WITH B. BERTEA / LARRY HANEK DATE 10/23/80

REPRESENTING RMI TIME 4:25 PM

PERMIT NO. _____ PHONE _____

OEPA STAFF SKOWRONSKI

SUBJECT _____

NOTES & SUMMARY: FOLLOW-UP DATE _____

(1.) a) DELETE Hg & Pb ON 001
b) TSS 30/45 NET
c) NEED TIME FOR FLOW METER

(2) RAISE M.H. ON 001

(3.) WOULD RESOLVE 002 OUTSIDE OF NPDES & F&O's APPEAR SATISFACTORY TO COMPANY
SKOW - TO CHECK W/ C.O.

(4.) Pg 3 : 002 ~~OBJECT~~ OBJECT TO Hg ANALYSIS
FREQUENCY OF ANALYSIS
(1/MO. MORE SATISFACTORY ≈ $1000/yr vs. $4000 ea)

(5) Pg 4 = 601 IMPASSE

(6) Pg 5 = 602 OK @ 1/WK

(7) Pg 6 OK

(8) Pg 7

MTG NOT WK OUT ~~FOR~~ 3RD @ NEDO PROBABLY 4 dk

Signature _____

OEPA-INDWW-3

TABLE 1

SUMMARY OF LABORATORY CHEMICAL ANALYSIS

Factor		Laboratory Test Data M-1	M-2	M-3	M-4	P-1	P-2	U.S. EPA Recommended Maximum Concentration
Arsenic,	ppm	0.056	0.017	0.001	0.027	0.003	0.005	5.0
Barium,	ppm	5.0	0.18	0.24	0.09	0.5	0.92	100.0
Cadmium,	ppm	0.44	<0.02	<0.02	<0.02	<0.02	<0.02	1.0
Chromium,	ppm	0.08	0.01	<0.01	<0.01	<0.10	0.05	5.0
Lead,	ppm	<0.20	0.04	<0.02	<0.02	<0.20	<0.08	5.2
Mercury,	ppm	0.0002	0.0002	<0.0001	0.0007	<0.0001	0.0001	0.2
Selenium,	ppm	0.001	0.004	<0.001	<0.001	<0.001	<0.001	1.0
Silver,	ppm	0.017	0.09	<0.02	<0.02	0.03	0.03	5.0
Xylane Water,		91	90	95	90	95	95	-
Volatile at 105°F, %		98.9	99.6	99.7	99.9	98.6	93	-
Volatile at 540°F, %		92.4	72.0	84.2	90.4	69.6	79.6	-
Chemical Oxygen Demand		604	208	306	68	420	127	-
pH		5.9	7.6	7.1	7.6	7.2	7.1	-
Conductivity Mohs/Cm. at 25°C		79002	6105	4429	1388	15800	12808	-

IRVD MINUTES OF DUD ... & INCLUDE THIS WITH IT IN 5/15.

Test Results - RMI *

Location / Date	Hg(ug/l)	Cd(mg/l)	Pb(mg/l)
Coal Pile Run-Off 4/15/81	<.2	<.01	<.03
South Ditch Outflow 4/15/81	<.2	.07	.07

* Testing Performed by Envirolab, Inc., Painesville, Ohio.

LSH:hm
5-7-81

Test Results - RMI *

Location/Date	Trichloroethylene(ug/l)	Perchloroethylene(ug/l)
M-4 3/18/81	3.8	<1.0
M-3 3/27/81	540	240
M-2 3/27/81	490,000	340,000
M-1 3/18/81	35,000	31,000
P-1 3/18/81	460	300
P-2 3/18/81	39,000	31,000

1500 ug/l
3400

* Testing performed by Envirolab, Inc., Painesville, Ohio.

LSH:hm

5-7-81

ROB
PERMIT FILE

OHIO ENVIRONMENTAL PROTECTION AGENCY

TELEPHONE MEMORANDUM

WITH Bernie Wilkens DATE 12-1-80

REPRESENTING RMI TIME 4:15pm

PERMIT NO. PHONE 652-9951

OEPA STAFF Skow

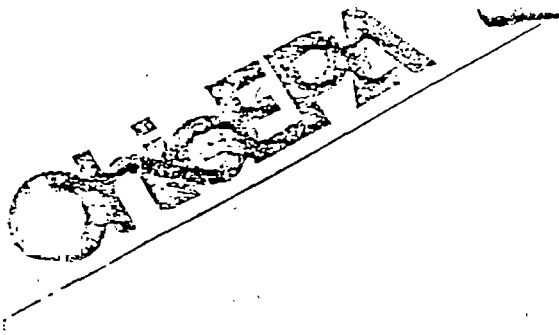
SUBJECT Sodium PCT Landfill

NOTES & SUMMARY: FOLLOW-UP DATE

1. RMI is hiring Herron to set up 3 observation wells around each of which 4 more wells will be made to determine movement. This will take 3-4 weeks and they would like to hold up comments on proposed F&O's 'til the study is complete. I have no objection; OK?
2. They'll probably want a meeting with us to discuss the study & we'll proceed from there.
3. Ind. W.W. will hold up the permit until F&O's are finalized.

Signature

OEPA-INDWW-3



Re: RMI - Sodium and Chlorine Plant
Landfill Closure & NPDES Permit

Mr. O. Bertea, General Manager
RMI Company
P.O. Box 550
Ashtabula, Ohio 44004

August 20, 1981

Dear Mr. Bertea:

We are in receipt of your submittal dated August 18, 1981, containing the closure proposal for the landfill located at the Sodium Plant.

The submittal included your cover letter, a two page narrative, exhibit #1 - locational map, exhibit #2 - plot plan, exhibit #3 - Dwg. No. 14-1021 - site drainage system, and exhibit #4 - Dwg. No. 14-1020.0 - proposed drainage ditches.

The proposal is well prepared and acceptable to this office. Closure should proceed as soon as possible. It is our understanding that Mr. Joe Holman will send us a copy of the lab analysis on cover material which will confirm its suitability for such use. We have the following minor comments:

1. If the monitoring wells will remain on site, please resubmit Dwg. No. 14-1021 with their locations. Also, waste materials should not be moved within a 100 foot radius of each well. If the wells are to be plugged, please contact Mr. Chris Khourey of this office for the proper procedures.

2. Precautions should be employed at changes in direction and intersections of drainage ditches to avoid unnecessary erosion.

3. Compaction of the cover material is recommended.

Also, please find enclosed a draft copy of our NPDES as submitted to Mr. Robert Phelps of our Columbus Office. Please note that upon his review, revisions may be necessary.

We appreciate the company's cooperation on these matters. Should you have any questions, do not hesitate to contact me.

Yours truly,

William T. Skowronski

William T. Skowronski, P.E.
Section Chief
Office of Land Pollution Control

WTS:mjo
Encl.

cc: Ashtabula County Health Dept.
R. Phelps, CO
R. Buda, NEDO
C. Khourey, NEDO
OLPC File - IWW File

RMI TITANIUM

RMI Company

O. BERTEA
GENERAL MANAGER–ASHTABULA OPERATIONS

ASHTABULA PLANTS
P. O. BOX 550
ASHTABULA, OHIO 44004
216/997-5141

May 22, 1981

Mr. William T. Skowronski, P.E.
Group Chief
Industrial Wastewater Division
Ohio Environmental Protection Agency
Northeast District Office
2110 E. Aurora Road
Twinsburg, Ohio 44087

Dear Mr. Skowronski:

Enclosed you will find a copy of the Herron report - Subject: Subsurface Investigation and Groundwater Monitoring - RMI Company Sodium Plant. This report should answer a number of the questions that you posed in our phone conversation last week. We can address other questions which you may have at our June 3, 1981 meeting.

You indicated that you wanted as much of the information as possible prior to our scheduled get-together.

Very truly yours,

RMI COMPANY

O. Bertea

OB:hm

Encls. - Herron Report

SUBSURFACE INVESTIGATION & GROUNDWATER MONITORING

RMI COMPANY

SODIUM PLANT

ASHTABULA, OHIO

F O R

RMI Company

P. O. Box 550

Ashtabula, Ohio 44004

HCI Project No: M-2178.143K

Report Submittal Date: 4 March 1981

HERRON CONSULTANTS, INC.
ENGINEERING • TESTING • INSPECTION

HERRON CONSULTANTS, INC.
ENGINEERING • TESTING • INSPECTION
5555 CANAL ROAD CLEVELAND, OHIO 44125
447-1335

4 March 1981

RMI Company
P. O. Box 550
Ashtabula, Ohio 44004

SUBJECT: SUBSURFACE INVESTIGATION & GROUNDWATER MONITORING
RMI COMPANY
SODIUM PLANT
ASHTABULA, OHIO

HCI Project No: M-2178.143K

This report summarizes the results of a study conducted at the request of Mr. George Hakkio, Chief Engineer - Ashtabula Plants. The investigated site is Sodium Plant of RMI Company in Ashtabula, Ohio.

The study was authorized per Purchase Order No. 3-68175, dated 7 December 1980. It was intended to determine the following:

(a) stratigraphic sequence of various geophysical formations within certain sectors of Sodium Plant of RMI Company in Ashtabula,

(b) nature and level of chemical contaminants within the investigated area's groundwater, and

(c) direction of groundwater flow and flow gradient.

SITE CONDITIONS

The investigated site measures approximately 700' x 700' in plan dimensions. It is located about 500' east of westerly property limits along State Road and 70' north of south property line. Approximately 100' east of north-east property limits there exist currently coal piles

belonging to Cleveland Electric Illuminating Company. Areas north and northwest of the investigated site are occupied by a system of railroad tracks, and RMI office buildings and manufacturing plant complex respectively. There also exists two ponds - one immediately to the southeast and the other approximately 350' west of the westerly limits of the investigated site. Another pond exists exterior to and in the vicinity of northwest corner of the subject site. An unpaved road, about twenty (20) feet wide, bounds those RMI sectors included under this investigation.

Surface water flowing from the CEI coal piles enters RMI at about mid-point of easterly limits of the investigated site and leaves the subject area at its approximate southwest corner.

A submitted drawing showing general layout and surface topography of RMI Sodium Plant in Ashtabula, Ohio, date of photography 11-16-79, date of mapping, December, 1979, project no. 178, indicates the surface elevations to range between minimums of about 635' along the unpaved peripheral road and maximums of over 645' in the vicinity of southeast investigated site sectors.

Further, during our site meeting with Mr. Hakkio on 25 November, 1980, we were informed that deposition of the miscellaneous fill materials was limited to approximately westerly half and southeast sections of the investigated site.

INVESTIGATION PROGRAM

At the time this study was undertaken in early December, 1980, it was proposed that three (3) monitoring wells should be installed within those site areas where fill materials had been deposited in the past. In connection with each of the monitoring wells, four observation holes were proposed to determine groundwater flow direction and flow gradient. It was also proposed that two additional solo observation holes, one each at where the surface water from CEI site enters and leaves the investigated RMI areas, be installed. At a later date, fourth monitoring well and associated four (4) observations holes were requested by Mr. Hakkio. Only

water samples taken from the four (4) monitoring wells and two (2) solo observation wells were proposed to be subjected to chemical analysis. Approximate locations of the individual monitoring and observation wells are shown on the accompanying Plot Plan which has been taken directly from the referenced document.

Overall field and laboratory program has involved the following:

Soil and Water Sampling Operations, and Laboratory Test Studies

At each of the monitoring and observation well locations, test holes were advanced by rotary drive drilling procedures, employing 7.0 inch o.d. by 3.25 inch i.d. hollow stem continuous flight augers.

Variations of soil and groundwater conditions encountered during the boring operations were noted only at the monitoring well locations. This was accomplished by taking representative samples of the existing subsoil at intervals by means of a two-inch o.d. split spoon sampling device, driven by a 140 pound hammer, free falling through a distance of thirty (30) inches. During the course of sampling operations, the number of hammer blows required to achieve eighteen (18) inches of sample spoon penetration, including an initial six-inch penetration, was noted and is recorded in six-inch increments under "Blow Counts" on the accompanying Test Boring Logs. The sum of the blow counts associated with the second and third six-inch penetration intervals is customarily termed "standard penetration resistance" (N).

The samples of materials obtained as a result of drive sampling operations were removed from the sampler, visually classified and placed in properly identified sealed glass sample jars. The subsoil material samples were then removed to our Cleveland soil mechanics laboratory for evalaution.

In addition to the soil samples, one (1) water sample from each of the monitoring wells and observations wells P-1 and P-2 were procured subsequent to their installation, details of which are given in the next section. The samples were brought to our Cleveland Chemistry laboratory for chemical analysis. The soil and water samples, were subjected to the following laboratory tests:

(a) The subsoil materials were reclassified in substantial accordance with the requirements of the American Society for Testing and Materials' method designation D 2488, "Description of Soils (Visual-Manual Procedures)" and identified employing the nomenclature of the Unified Soil Classification System (ASTM D 2487).

The results of visual-manual classification operations, together with certain pertinent data developed during field exploration operations, are included on the accompanying Test Boring Logs.

(b) Water samples were subjected to chemical analysis for determination of the following:

Arsenic
Barium
Cadmium
Chromium
Lead
Mercury
Selenium
Silver
Xylene Water
Volatile at 105°F
Volatile at 540°F
Chemical Oxygen Demand
pH
Conductivity

Installation of Monitoring and Observation Wells

Each observation well primarily consisted of about fifteen (15) feet long, two-inch diameter perforated PVC pipe. The pipe was installed immediately following drilling the hole with 7.0-inch o.d. hollow stem continuous flight auger.

Monitoring well consisted of about twenty-five (25) foot long 6-inch diameter flush joint schedule 80 PVC casing with five (5) foot long no. 60 slot PVC well screen at the bottom.. Because of the difficulty in keeping the test holes open subsequent to removal of 7.0 inch o.d. flight augers, at each monitoring well location holes were redrilled with 12-inch o.d. solid stem auger immediately prior to well installation. Sand was poured in the annular space between the PVC pipe and the surrounding soil for full depth minus between about two (2) and three (3) feet. Each well was then completed by filling the remaining annular space with bentonite balls. Each well extended by between about two (2) and four (4) feet above the surrounding site grade. Each monitoring well casing was protected by an 8-inch diameter and about five (5) foot long protective iron pipe with lockable cover.

Typical details of the monitoring and observations are shown in Plates 1 and 2 respectively.

RESULTS

(a) Subsurface Profile

Results of the field drilling operations indicate the site areas to be overlain by fill materials consisting of sand, clay, brick, and/or concrete, and/or cinder and occasional chemical odor. Following thicknesses of the fill materials were indicated at the monitoring well locations from where soil samples were taken:

Test Position	Fill Thickness, ft.
M-1	5.0±
M-2	9.5±
M-3	9.0±
M-4	-

Inferior to surface grades and/or the fill materials, area's predominant subsurface formation consists of brown and/or gray silty clay with occasional lenses/layers of sand and silt. Cohesive materials exhibit medium to hard structural states and moist to wet consistencies. At positions M-1 and M-3, silty clay was found to be intersticed with medium to dense and wet layers of gray silt. Silt layers ranged in thickness of between about 1.5 and three (3) feet, and were encountered at varying depths. Subsurface materials at M-1 and M-2 exhibited strong chemical odor through full depth of field exploratory operations.

During the course of field exploratory operations, the following water depths were indicated.

Test Location	Water Depth, ft. Encounter	Completion
M-1	4.0	-
	21.5	
M-2	12.0	-
	27.0	
M-3	16.0	-
M-4	27.0	26.0
	23.0 (Seepage)	12.4 (4-hours)

(b) Chemical Evaluation

Results of the laboratory chemical analysis and the maximum concentrations recommended by U.S. Environmental Protection Agency (Reference: FEDERAL REGISTER, Vol. 45, No. 98, May 19, 1980, Rules and Regulations), wherever applicable, are given in the accompanying Table No. 1. Report by Crobaugh Division of Herron Testing Laboratories, Inc. where the chemical tests were performed, is also included in the Appendix to this submittal.

The table shows that at the subject site, the level of heavy metal contaminants is far below the upper limits recommended by U.S., EPA.

(c) Groundwater Monitoring

The following two (2) methods have been employed to determine direction of the groundwater flow and the flow gradient.

Graphical

This involves establishment/determination of

(i) location of the individual monitoring and observation wells,

(ii) elevation of the ground at the monitoring and observation well locations, and

(iii) groundwater table elevations

Summary of the ground and the groundwater elevations is included in the accompanying Table No. 2.

Using the data of Table No. 2, direction of groundwater flow and the flow gradient were determined for three different cases. The method utilizes one upgradient and two down gradient water wells, and is illustrated in Plates #3, #4 and #5. The three cases investigated resulted in the following groundwater flow directions and flow gradients.

Plate Number	Groundwater Flow Direction	Flow Gradient
3	Towards S 32.5° W	0.026
4	Towards N 17° W	0.0133
5	Towards S 17° W	0.0117

NOTE: "North" has been assumed to be parallel to State Road.

It must be recognized that groundwater flow direction is significantly influenced by the local topography of the area. It is evident from the results, tabulated above, that groundwater has the tendency to flow generally towards the existing creek which crosses the investigated site immediately west of M-4 in the north-south direction, south of M-2 and north of M-1 in the east-west direction, and leaves the site in the vicinity of P-2. The influence of local surface topography and drainage pattern on the preferential direction of groundwater flow is exemplified in Plates #3, #4 and #5. For instance, in Plate #4 which involves wells M-1, M-2 and P-2, located on either side of east-west section of the creek and in the vicinity of southerly property limits, flow is indicated towards northwest direction; while in Plate #3 representing wells M-1, M-2, M-3 located on either of north-south section of creek, groundwater flow was found to be towards south-west direction. Such variations in the flow direction can and will occur where sudden alterations in either the surface topography and/or the drainage pattern are either introduced or exist.

Dye Injection

To supplement the information gathered from graphical representation relative to groundwater flow direction, dye was introduced in monitoring wells M-1, M-2 and M-3 on 11 March, 1981. The intention being that appearance of this dye in any of the surrounding observation wells will reflect the general directions of groundwater flow. Field visit was made on 17 March 1981 to observe if in fact dye had traversed to any of the observation wells. No dye was detected. This in our opinion is due to very low permeability of the area's silty clay soils. With the known permeabilities of silty clay formation to range between 10^{-5} and 10^{-7} cm/sec., it could take extended time period before dye will be seen in any of the observation wells surrounding a particular monitoring well unless of course, the water is forced to flow under pressure. This process will require extensive preparation and time involvement in the field.

We thank you for the opportunity to work on this project and look forward to working with you in the future. In the meantime, if you have any questions, please do not hesitate to contact us.

HERRON CONSULTANTS, INC.

Vijay K. Khosla, Ph.D., P. E.
Director of Engineering

VKK/lk

3cc: The RMI Company

TABLE 1

SUMMARY OF LABORATORY CHEMICAL ANALYSIS

Factor		Laboratory Test Data M-1	M-2	M-3	M-4	P-1	P-2	U.S. EPA Recommended Maximum Concentration
Arsenic,	ppm	0.056	0.017	0.001	0.027	0.003	0.005	5.0
Barium,	ppm	5.0	0.18	0.24	0.09	0.5	0.92	100.0
Cadmium,	ppm	0.44	<0.02	<0.02	<0.02	<0.02	<0.02	1.0
Chromium,	ppm	0.08	0.01	<0.01	<0.01	<0.10	0.05	5.0
Lead,	ppm	<0.20	0.04	<0.02	<0.02	<0.20	<0.08	5.2
Mercury,	ppm	0.0002	0.0002	<0.0001	0.0007	<0.0001	0.0001	0.2
Selenium,	ppm	0.001	0.004	<0.001	<0.001	<0.001	<0.001	1.0
Silver,	ppm	0.017	0.09	<0.02	<0.02	0.03	0.03	5.0
Xylane Water,		91	90	95	90	95	95	-
Volatile at 105°F, %		98.9	99.6	99.7	99.9	98.6	93	-
Volatile at 540°F, %		92.4	72.0	84.2	90.4	69.6	79.6	-
Chemical Oxygen Demand		604	208	306	68	420	127	-
pH		5.9	7.6	7.1	7.6	7.2	7.1	-
Conductivity Mohs/Cm. at 25°C		79002	6105	4429	1388	15800	12808	-

TABLE 2

SUMMARY OF STATION AND GROUNDWATER ELEVATIONS

Station Number	Station Elevation, MSL Ground	Pipe	Water Elevation MSL 1-31-1981	2-26-1981	3-11-1981*
M-1	636.60	639.17	633.60	634.3	633.6
E01	636.80	638.93			
W01	636.70	640.46			
N01	637.50	641.72			
S01	636.20	638.65			
M-2	637.20	639.35	631.20	631.1	630.6
E02	638.10	640.36			
W02	636.40	638.91			
N02	637.50	641.19			
S02	636.80	639.28			
M-3	641.20	643.03	636.20	636.9	637.1
E03	641.00	643.35			
W03	640.00	642.59			
N03	640.60	642.67			
S03	641.00	642.89			
M-4	637.80	641.56	636.30	636.4	635.7
E04	637.00	639.46			
W04	638.00	640.29			
N04	637.50	639.67			
S04	637.10	639.37			
P-1	634.50	636.21	632.5	632.9	632.5
P-2	632.70	636.19	629.2	630.4	631.7

(*) Represents stable groundwater condition since no significant rainfall occurred between 2-26-1981 and 3-11-1981.

HERRON TESTING LABORATORIES, INC.
CROBAUGH DIVISION
INORGANIC AND ORGANIC ANALYSIS
5405 E. SCHAAF RD.
CLEVELAND, OH 44131
(216) 524-1450

Purchase Order No. M 2178
File No. C 4555
February 27, 1981

Analysis of Six (6) Water Samples
Marked Please see below

Client The R.M.I. Company
P.O. Box 550
Ashtabula, Ohio 44004

Received on 2-3-81

CHEMICAL ANALYSIS

Customer I.D.	P1	P2	M1	M2	M3	M4
HTL I.D.	C 4555-1	C 4555-2	C 4555-3	C 4555-4	C 4555-5	C 4555-6
HCI I.D.	1	2	3	4	5	6
Arsenic	0.003	0.005	0.056	0.017	0.001	0.027
Barium	0.50	0.92	5.0	0.18	0.24	0.09
Cadmium	<0.02	<0.02	0.44	<0.02	<0.02	<0.02
Chromium	<0.10	0.05	0.08	0.01	<0.01	<0.01
Lead	<0.20	<0.08	<0.20	0.04	<0.02	<0.02
Mercury	<0.0001	0.0001	0.0002	0.0002	<0.0001	0.0007
Selenium	<0.001	<0.001	0.001	0.004	<0.001	<0.001
Silver	0.03	0.03	0.17	0.05	<0.02	<0.02
(Xylene) H_2O	95%	95%	91%	90%	95%	90%
Volatiles 105°C.	98.6%	93.0%	98.9%	99.6%	99.7%	99.9%
Volatiles 540°C.	69.6%	79.6%	92.4%	72.0%	84.2%	90.4%
COD	420	127	604	208	306	68
pH	7.2	7.1	5.9	7.6	7.1	7.6
Conductivity-umhos/cm @ 25°C.	15800	12808	79002	6105	4429	1388

The above results are in mg/l unless otherwise specified.

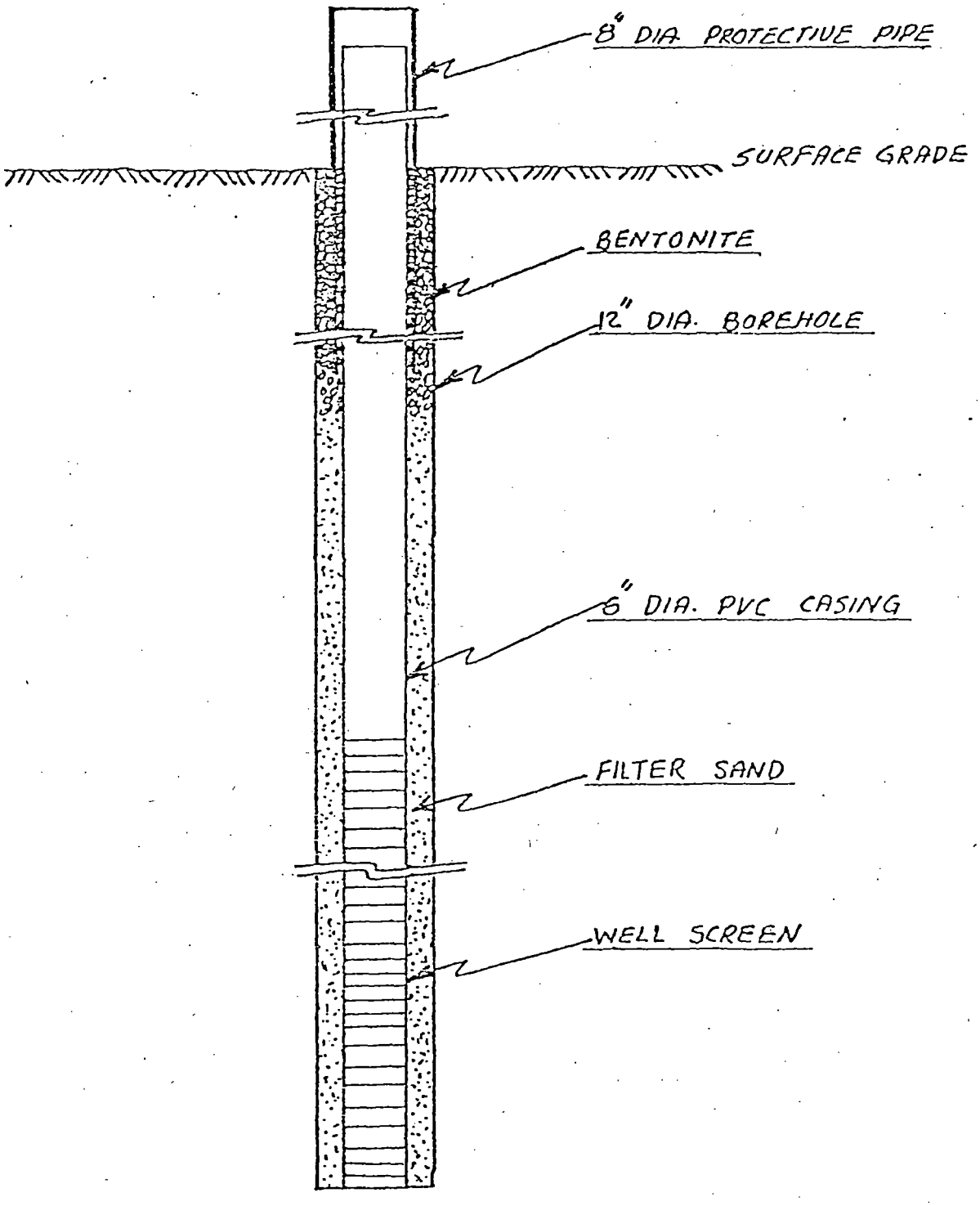
The water content by xylene distillation is an empirical value utilized to give an estmiation of the possibilty of low boiling point volatile organics.

Respectfully submitted,

CROBAUGH DIVISION
HERRON TESTING LABORATORIES, INC.

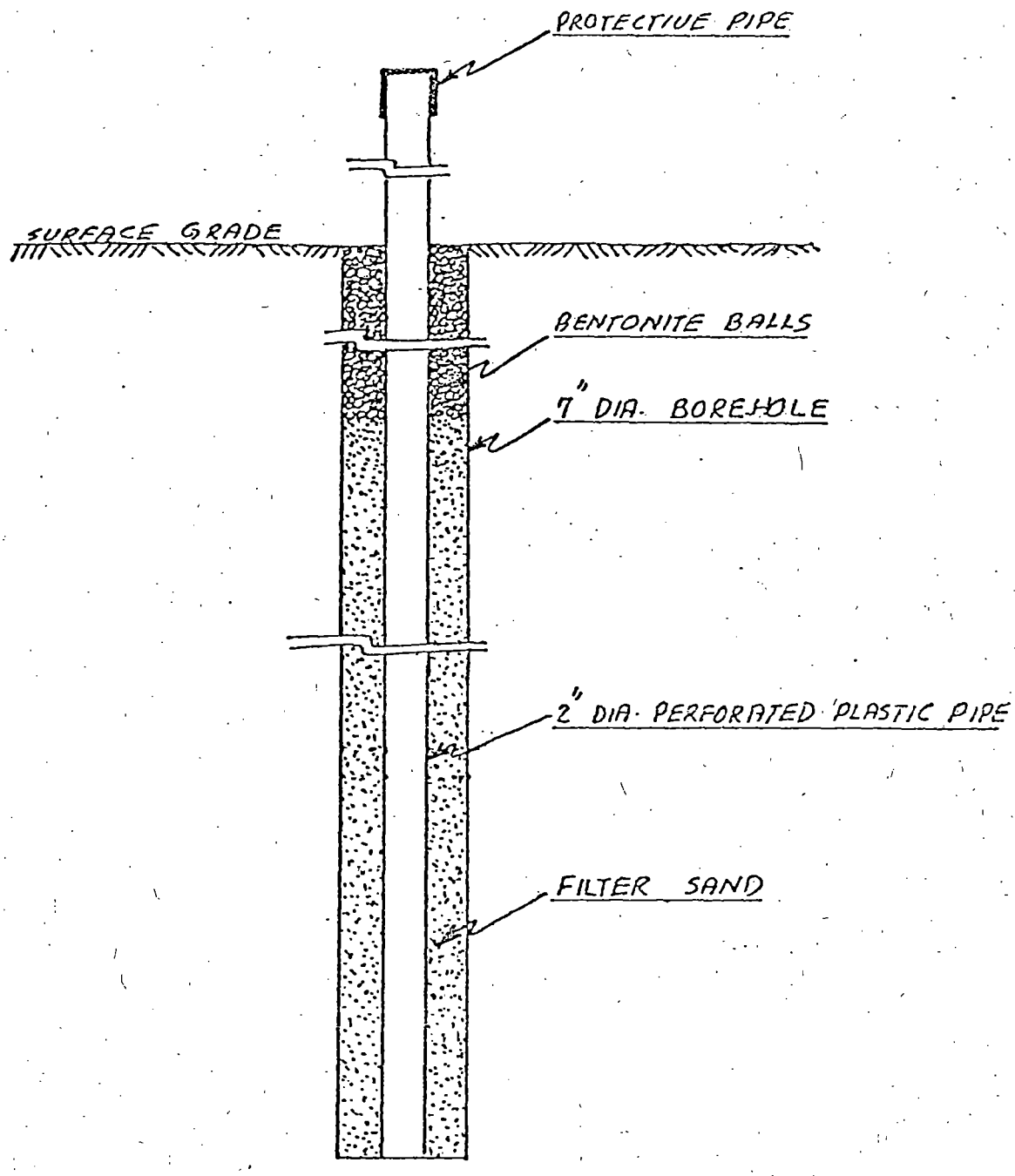
Robert Haddad
Technical Administrator

ljc



SCHEMATIC MONITORING WELL

PLATE NO. 1



SCHEMATIC OBSERVATION WELL

PLATE NO. 2

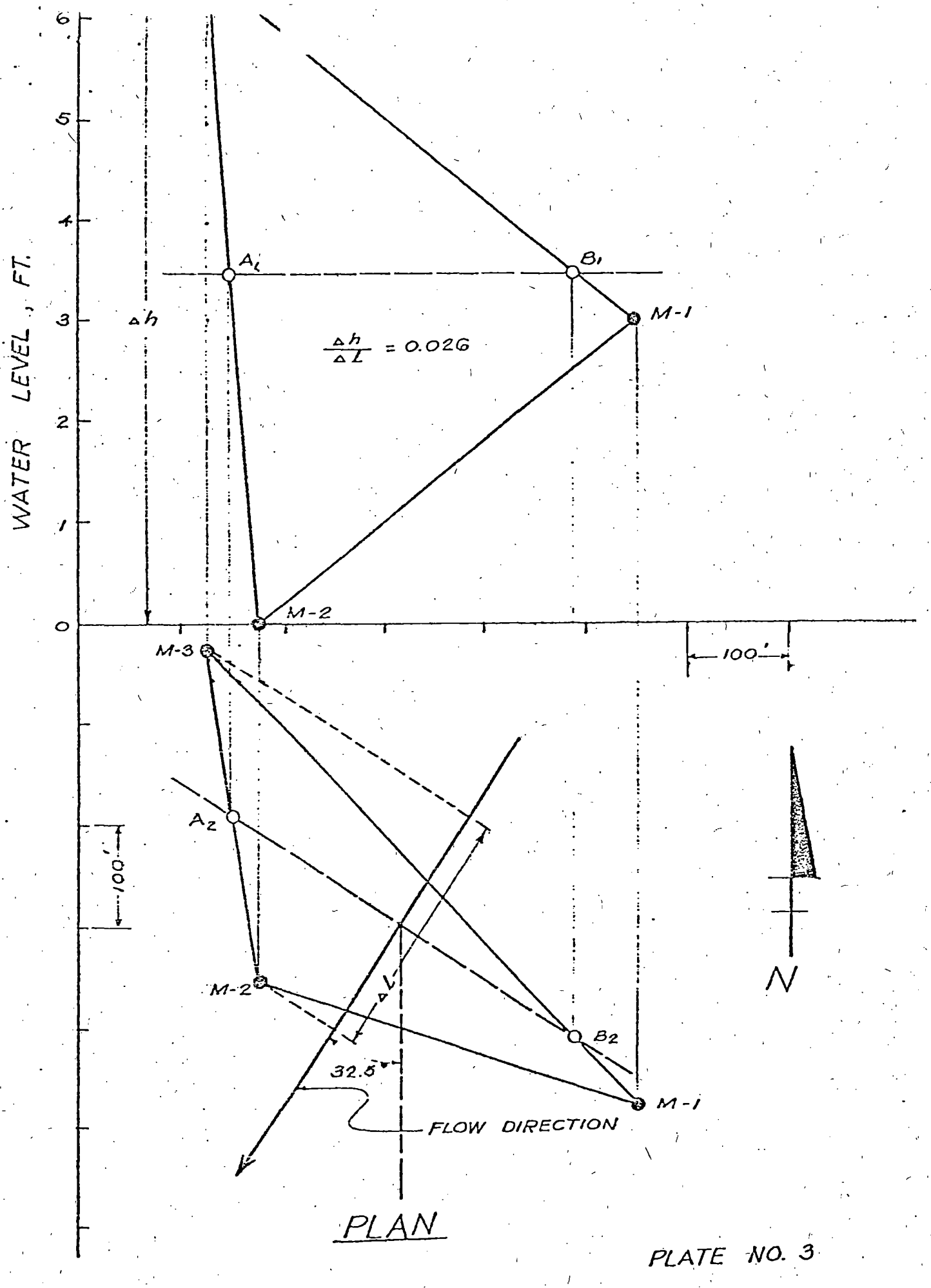
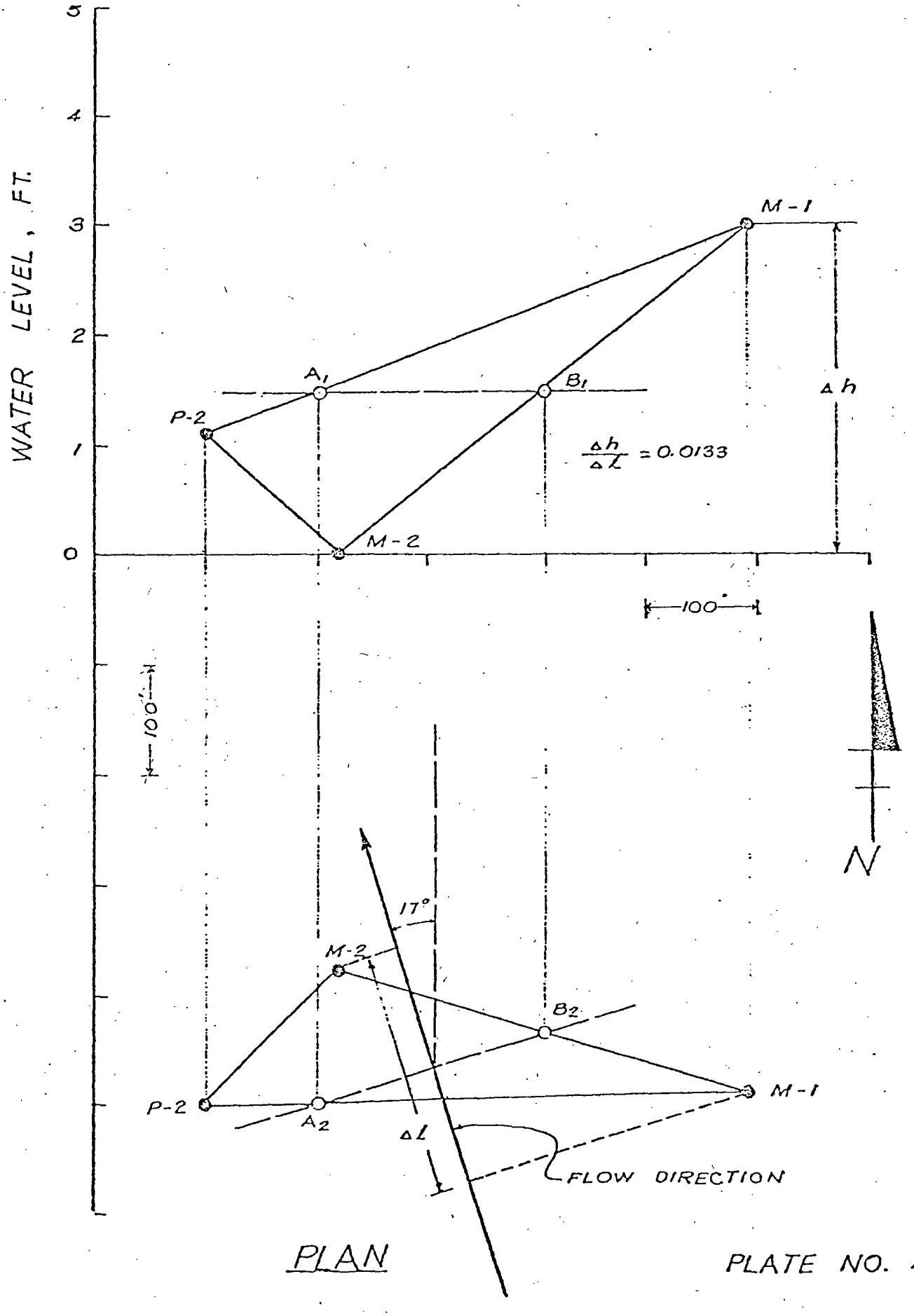

WATER LEVEL, FT.
6
5
4
3
2
1
0
A1
B1
M-1
Δh
Δh/ΔL = 0.026
M-2
M-3
100'
A2
100'
M-2
ΔL
B2
32.5°
M-1
FLOW DIRECTION
N
PLAN

PLATE NO. 3



PLAN

PLATE NO. 4

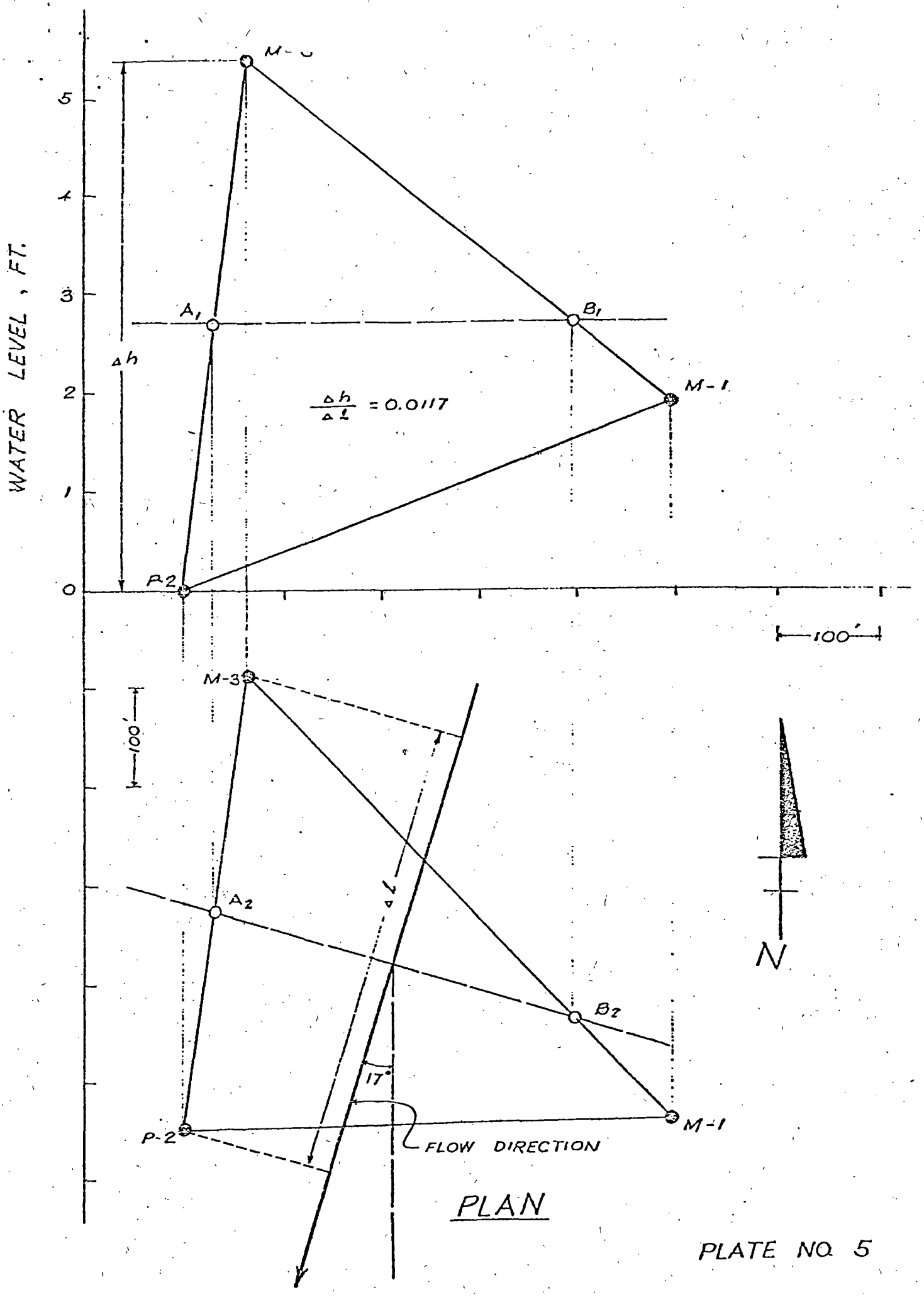

WATER LEVEL, FT.
5
4
3
2
1
0
M-3
A1
B1
M-1
P-2
Δh
Δh/Δl = 0.0117
100'
100'
M-3
A2
B2
M-1
P-2
Δl
17°
FLOW DIRECTION
N
PLAN

PLATE NO. 5

TEST BORING LOG

FILE NO.: M-2178.143

PROJECT: POND AREA - SODIUM PLANT - STATE ROAD - ASHTABULA OHIO

FOR: THE RMI COMPANY - ASHTABULA, OHIO

ELEV. DATUM: DRILLED: DECEMBER 23, 1980 BY T. LATOS

ELEV. (FT.)	DEPTH (FT.)	LOG	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT	CLASSIFICATION
	0		1	SS	73-24-24	Miscellaneous Fill consisting of Sand and Crushed Concrete. Dense. Moist.
			2	SS	30/6"	
			3	SS	3-3-2	Brown COARSE AND MEDIUM SAND. Fill. Loose. Wet. (SP)
	5		4	SS	4-4-6	Brown and Gray Mottled SILTY CLAY. Chemical Odor noted. Stiff. Moist. (CL)
			5	SS	4-5-5	
			6	SS	5-7-3	Brown and Gray Layers of SILT and SILTY CLAY. Chemical Odor noted. Stiff. Wet. (ML) and (CL)
	10		7	SS	8-8-7	
			8	SS	6-9-14	Brown SILTY CLAY. Trace Sand. Some Silt Layers in formation. Chemical Odor noted. Stiff to Very Stiff. Moist. (CL)
			9	SS	9-12-14	
			10	SS	10-13-12	
	15		11	SS	11-14-16	
			12	SS	12-12-14	
			13	SS	12-16-20	Gray SILTY CLAY. Some Silt Layers in formation. Chemical Odor noted. Hard. Moist. (CL)
	20		14	SS	19-17-19	Gray SILT. Some Clay. Chemical Odor noted. Dense. Wet. (ML)
			15	SS	11-5-6	Gray SILTY CLAY. Some Silt Layers in formation. Chemical Odor noted. Stiff. Moist. (CL)
			16	SS	4-5-7	
	25					

GROUNDWATER:
ENCOUNTER: 4.0' & 21.5'
AT COMPLETION:
AFTER AT
TERMINAL DEPTH: 24.0'

HERRON CONSULTANTS, INC.
ENGINEERING • TESTING • INSPECTION

TEST BORING LOG

FILE NO.: M-2178.143K

PROJECT: POND AREA - SODIUM PLANT - STATE ROAD - ASHTABULA, OHIO

FOR: THE RMI COMPANY - ASHTABULA, OHIO

ELEV. DATUM: DRILLED: JANUARY 9, 1981 BY T. LATOS

ELEV. (FT.)	DEPTH (FT.)	LOG	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT	CLASSIFICATION
	0					0 - 2.0' Sand, Clay and Brick. Fill. Frozen.
			1	SS	8-10-10	Brown and Gray SILTY CLAY. Some Sand. Trace Gravel. Chemical Odor noted. Fill. Very Stiff to Stiff. Moist. (CL)
			2	SS	6-8-9	
	5		3	SS	4-6-8	
			4	SS	5-5-9	Layers of Cinders and Brown Silty Clay. Chemical Odor noted. Fill. Stiff. Moist.
			5	SS	5-6-7	
	10		6	SS	6-6-6	
			7	SS	6-7-6	Brown SILTY CLAY. Chemical Odor noted. Stiff to Very Stiff. Moist. (CL)
			8	SS	5-7-8	
	15		9	SS	7-14-17	
			10	SS	12-15-19	
			11	SS	5-7-9	
			12	SS	6-6-8	
	20		13	SS	5-6-4	
			14	SS	4-6-9	Gray SILTY CLAY. Layers of Silt throughout formation. Chemical Odor noted. Stiff to Very Stiff. Moist. Wet at 26.0'. (CL)
			15	SS	4-4-3	
	25		16	SS	5-7-7	
			17	SS	6-7-8	
			18	SS	5-8-8	
	30		19	SS	6-6-9	
	35					

GROUNDWATER: ENCOUNTER: 12.0' & 27.0'

AT COMPLETION:

AFTER AT

TERMINAL DEPTH: 30.5'

HERRON CONSULTANTS, INC.
ENGINEERING - TESTING - INSPECTION

TEST RING LOG

TEST HOLE

FILE NO.: M-2178 143K

PROJECT: POND AREA - SODIUM PLANT - STATE ROAD - ASHTABULA, OHIO

FOR: THE RMI COMPANY - ASHTABULA, OHIO

LEV. DATUM: DRILLED: DECEMBER 18, 1980 BY T. LATOS

ELEV. (FT.)	DEPTH (FT.)	LOG	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT	CLASSIFICATION
	0		1	SS	6-7-8	Mixture of Brown Silty Clay and Cinders. Fill. Stiff. Moist.
			2	SS	5-4-7	Brown CLAYEY SAND, Silty. Trace Gravel. Fill. Medium. Moist. (SC)
			3	SS	7-5-4	
	5		4	SS	5-4-5	Layers of Cinders and Brown Silty Clay. Fill. Stiff to Soft. Moist.
			5	SS	2-2-2	
			6	SS	2-4-5	
			7	SS	9-12-14	
	10		8	SS	12-14-17	Brown SILTY CLAY. Trace Sand. Very Stiff to Hard. Moist. (CL)
			9	SS	11-14-11	
			10	SS	7-14-14	
	15		11	SS	7-7-8	Gray SILT. Some Clay. Medium. Wet. (ML)
			12	SS	8-8-8	
			13	SS	7-10-11	
	20		14	SS	6-7-9	Gray SILTY CLAY. Some Silt Layers noted in formation. Very Stiff. Moist. (CL)
			15	SS	8-9-11	
			16	SS	7-10-14	
	25					

GROUNDWATER: ENCOUNTER: 16.0'

AT COMPLETION:

AFTER AT

TERMINAL DEPTH: 24.0'

HERCON CONSULTANTS, INC.
ENGINEERING - TESTING - INSPECTION

TEST BORING LOG

FILE NO.: M-2178.143K

PROJECT: POND AREA - SODIUM PLANT - STATE ROAD - ASHTABULA, OHIO

FOR: THE RMI COMPANY - ASHTABULA, OHIO

ELEV. DATUM: _____ DRILLED: JANUARY 20, 1981 BY T. LATOS

ELEV. (FT.)	DEPTH (FT.)	LOG	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT	CLASSIFICATION
	0					
			1	SS	4-4-5	Brown SILTY CLAY. Sand Lenses. Medium to Stiff. Moist. (CL)
	5		2	SS	5-6-8	
			3	SS	5-7-11	
	10		4	SS	8-9-14	Brown and Gray SILTY CLAY. Stiff. Moist. (CL)
	15		5	SS	5-7-8	Gray SILTY CLAY. Medium Stiff. Moist. (CL)
	20		6	SS	4-5-7	
	25		7	SS	12-15-16	Gray SILTY CLAY. Stiff. Moist to Wet. (CL)
	30		8	SS	6-7-9	Gray SILTY CLAY. Stiff. Moist to Wet. (CL)

GROUNDWATER:
ENCOUNTER: 27.0'-SEEPAGE @ 23.0'
AT COMPLETION: 26.0'
AFTER 4 HOURS AT 12.7'
TERMINAL DEPTH: 30.0'

HERRON CONSULTANTS INC
ENGINEERING • TESTING • INSPECTION

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			GROUP SYMBOL	GRAPHIC SYMBOL	TYPICAL NAME
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS	GW		WELL GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
			GP		POORLY-GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES	GM		SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
			GC		CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SAND AND SANDY SOILS	CLEAN SAND	SW		WELL-GRADED SANDS OR GRAVELLY SANDS, LITTLE OR NO FINES
			SP		POORLY GRADED SANDS OR GRAVELLY SANDS, LITTLE OR NO FINES
		SAND WITH FINES	SM		SILTY SANDS, SAND-SILT MIXTURES
			SC		CLAYEY SANDS, SAND-SILT MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS LL<50		ML		INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL		INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL		ORGANIC SILTS AND ORGANIC SILT-CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LL>50		MH		INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SOILS
			CH		INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAY
			OH		ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			Pt		PEAT AND OTHER HIGHLY ORGANIC SOILS

BOULDERS — COARSER THAN 6 INCHES

COBBLES — 3 INCHES TO 6 INCHES

GRAVEL

COARSE — .75 INCHES TO 3 INCHES

FINE — 4.76 MM. TO .75 INCHES

SAND

COARSE — 2.00 MM. TO 4.76 MM.

MEDIUM — .42 MM. TO 2.00 MM.

FINE — .074 MM. TO .42 MM.

SILT — .005 MM. TO .074 MM.

CLAY — FINER THAN .005 MM.

PER ASTM D 2487

HERROD CONSULTANTS, INC.

ENGINEERING • TESTING • INSPECTION

GENERAL NOTES FOR TEST BORING LOGS

ENTERED UNDER SAMPLE TYPE:

CA — Continuous Flight Auger Sample
HA — Hand Auger Sample

Disturbed sample obtained from auger flight.

SS — Split Barrel Sample (2" O.D., 1.375" I.D.)*

Driven sampler for disturbed sample.

ST-2 — Thin-Walled Shelby Tube Sample (2" O.D., 1.875" I.D.)
ST-3 — Thin-Walled Shelby Tube Sample (3" O.D., 2.875" I.D.)
PT — Thin-Walled Piston Tube Sample

Static force pressed sampler for "undisturbed" sample.

LS — Sectional Liner Sample (Ring Shear)

W — Wash Sample

Obtained from churn-drive boring methods.

DC — Diamond Rock Core Barrel Sample (unspecified size)
NX — 2.125" I.D. Diamond Rock Core Barrel Sample
BX — 1.625" I.D. Diamond Rock Core Barrel Sample
AX — 1.1875" I.D. Diamond Rock Core Barrel Sample

ENTERED UNDER SAMPLE NO.:

[2] — Indicates sample number and acquisition interval.

ENTERED UNDER BLOW COUNT:

EXAMPLE: 6/9/12 — The number of blows of a 140-pound hammer, free falling through a distance of 30 inches, required to drive a standard (2" O.D., 1.375" I.D.) split barrel sampler into the soil, including an initial six-inch seating penetration. Blows recorded in 6-inch increments for a distance of 18 inches.

EXAMPLE: 60/2" — The number of blows (60) required to drive a standard split barrel sampler for a distance (2") of less than one foot.

SSR — Split barrel sampler penetration refusal at advance of less than one inch for 50 blows.

AR — Auger refusal.

(*) Other diameters, when employed, are noted on Boring Log.

HERRON CONSULTANTS, INC.
ENGINEERING • TESTING • INSPECTION

Re: NPDES Permit No. E 312

On May 8, 1981, at 10:00 A.M. representatives of the OEPA and the RMI company (Sodium Plant) met in Columbus to discuss terms for the issuance of an NPDES permit and closure of an on-site landfill. Attending the meeting were:

E. R. Toth, RMI	A. Turner, OEPA
O. Bertea, "	R. Phelps, "
L. Hanek, "	J. Adair, " (Legal)
J. Holman, "	W. Skowronski, "
R. Leith, "	R. Buda, "
R. Falsgrath,"	

The company presented monitoring data for the landfill, an area located on their property. This data represents analyzed water samples from the wells drilled by the company. It showed that the levels for the parameters analyzed were well below those considered to be hazardous by the U.S. EPA. Results of the surface water testing indicated a slight problem with lead and cadmium.

RMI did discover a new problem, the chemicals trichloroethylene and perchloroethylene were found in some soil samples tested by the entity. These chemicals have never been utilized by the company. RMI did not care to postulate as to how the chemicals came to be found in the soil on their property.

At the close of the meeting, it was decided that a meeting would be held with our geologist so that a determination could be made pertaining to the direction of ground water flow. Melinda Becker would also be present at this meeting to discuss the closure steps.

The entity is willing to begin the closure of this site immediately.

Issuing Findings and Orders would eliminate the need for a Permit to Install.

Robert E. Buda
Environmental Scientist

REB:mjo
May 19, 1981

RMI TITANIUM

RMI Company

METALS REDUCTION PLANT

P. O. BOX 490
ASHTABULA, OHIO 44004
216/997-5141 TWX 810-427-2937

RECEIVED
APR - 4 1985
OHIO EPA-N.E.D.O.

April 1, 1985

Ohio Environmental Protection Agency
Division of Water Pollution Control
N. E. District Office
2110 E. Aurora Road
Twinsburg, OH 44087

Attn: Mr. William J. Miller - District Representative

Gentlemen:

Per your request the following schedule will be implemented persuant to RMI Sodium Plant pond cleaning, sodium bisulfite addition to the Catalytic Decomposition process outlet, and the general overhaul of the Catalytic system equipment and piping.

1)	Pond cleaning -	#1 - October 1985 #2 - May 1985
2)	Bisulfite addition -	October 1985
3)	Overhaul of Catalytic System -	Engineering & drawing work during 1985
		Purchase & construction 2nd & 3rd quarters - 1986

Sincerely yours,

B. J. Baughman

B. J. Baughman, Manager
Engineering-Ashtabula Plants

/jmb

Re: RMI Company
Sodium Plant
Ashtabula/Ashtabula County
Industrial Waste

Mr. Joe T. Holman
Supervisor - Environmental Control
RMI Company
1000 Warren Avenue
Niles, Ohio 44446

November 19, 1984

Dear Mr. Holman:

Enclosed are a draft permit and Director's Findings and Orders for the above facility. I am told by my Central Office that there must be two separate documents in order to comply with legal requirements.

Nevertheless, I believe the substance of the documents is in accordance with our previous discussions. I will await your comments on them and will discuss the matter or meet with you at your convenience.

Sincerely,

William J. Miller

William J. Miller
Environmental Engineer
Industrial Wastewater

WJM:mjo

Encl.

cc: John Morrison, IWW, CO, w/encl.
Gary Amendola, USEPA, Westlake w/a

RMI TITANIUM

RMI Company

P. O. BOX 269
1000 WARREN AVENUE
NILES, OHIO 44446
216/652-9951 TWX 810-436-2600

June 14, 1984

Mr. William Miller
Ohio EPA
Northeast District Office
2110 E. Aurora Road
Twinsburg, Ohio 44087

Subject: Analytical Results ~~Associated with~~ Sewer Cleaning at the RMI Company - Sodium Plant

Dear Mr. Miller:

A 150 foot section of 36" sewer line located on Sodium Plant property and 900 feet of 48" sewer line, which conduits the water to Fields Brook, were cleaned during the period May 1 - 17 (11 days of actual cleaning).

During cleaning operations, composite samples were taken at 15 minute intervals at the closest manhole downstream of the work area. Samples were analyzed for settleable solids, total dissolved solids, and total suspended solids. Sampling was discontinued on May 11, 1984.

As expected, the impact on the receiving stream was limited to increasing the total suspended solids loading. If the suspended solids released during the last four days of cleaning was at the same rate as during the first seven days, the TSS contribution from the 48" line entering Fields Brook was two to three times normal. Therefore the impact on the brook was negligible.

We appreciate your assistance in accomplishing this much needed cleaning project.

If you have any questions or need additional information, give me a call.

Sincerely,

Joe T. Holman

Joe T. Holman
Supervisor - Environmental Control

Enclosure

NOTES ACCOMPANYING WASTEWATER FLOW DIAGRAM LS-113 FOR THE SODIUM PLANT

A. Approximately 165,000 gallons per day of boiler blowdown is generated each day.

B. Water from the barometric condenser is non-contact cooling water. When the salt evaporator is running at capacity, 200,000 gpd of cooling water is discharged.

C. The sodium cells utilize non-contact cooling water in the process. During the summer, with 100 cells on line, the cooling water requirement is 3,600,000 gpd, of which 1,150,000 gpd is recycled.

D. 200,000 gpd of non-contact cooling water is used at the sodium molding and tank car areas.

E. Chlorine pumping and scrubbing uses 1,165 gpd of non-contact cooling water and 56,000 gpd of process type water. The process water, containing sodium, calcium, hypochlorite, and sulfate, flows to the #1 Treatment Pond (see Diagram LS-112).

F. 44,000 gpd of process water, containing inorganic salts (primarily sodium chloride), is pumped to the #2 Treatment Pond (see Diagram LS-112).

G. 50,000 gpd of wastewater is generated during the cleaning of cell parts. Major contaminant is sodium hydroxide. Waste is pumped to #2 Treatment Pond (see Diagram LS-112).

H. Approximately 15,000 gpd of treated sanitary wastewater is treated each day.

NOTE: Currently the facility discharges approximately 3.0 mgd of wastewater per day. Water conservation efforts are being applied, which has a tendency to raise the total dissolved solids concentration in the final effluent.

OhioEPA

September 1984

RMI Company - ~~Sodium Plant~~
P.O. Box 550
Ashtabula, Ohio 44004

Dear Mr. L.S. Hanek:

Ohio EPA implemented new data processing programs in July 1983 which made it necessary to change the OEPA National Pollutant Discharge Elimination System (NPDES) permit number. The status of your NPDES permit, however, prevented automatic notification to you of this change at that time.

To expedite processing your reported data it would be appreciated if the following new permit number is used on future reports. This new number should prefix the monitoring station designator you are currently using which results in an eleven digit stationcode.

Old Ohio NPDES Permit Number:	E312
New Ohio NPDES Permit Number:	3IE00012
Application Number:	OH0002313

Thank you in advance for your cooperation in this matter. If I can be of further assistance to you, please don't hesitate to contact me at (614) 466-8313.

Sincerely,

Sandra J. Turner

Sandra J. Turner, Manager
Permits & Compliance Programs

cc: Northeast District Office
File

Enclosures: Blank EPA-SUR-1 Forms

16-RMI
Sodium
9-18-84

POLLUTION CONTROL OPTIMIZATION

Within 1 month after the effective date of this permit, the permittee shall conduct a pollution control optimization study that shall:

1) Identify all wastewater streams bearing total Residual Chlorine (TRC), their sources, and their routes of travel thru the permittee's facilities and to Fields Brook.

2) Obtain sufficient accurate data to quantify TRC at the egress from Lagoon No. 5, at the egress from the catalytic converter system, and at the egress from outfall 001.

3) Identify all wastewater streams bearing total suspended solids(TSS), their sources, and their routes of travel thru the permittee's facilities and to Fields Brook.

4) Obtain sufficient accurate data to quantify TSS at the egress from Lagoon No. 5, at the egress from outfall 001 and at a representative point of the water supply intake from Ashco.

5) Discuss possible treatment alternatives and possible additional treatment methods to further reduce the discharge of TRC and TSS to Fields Brook.

Within 3 months of the effective date of this permit, the permittee shall submit to the Ohio EPA a progress report on the status of the optimization study.

Within 4 months of the effective date of this permit the permittee shall complete the optimization study.

Within 5 months of the effective date of this permit, the permittee shall submit the optimization study to the Ohio EPA for review.

Within 6 months of the effective date of this permit, the permittee shall complete and submit to the Ohio EPA an appropriate NPDES Permit Renewal Application.

Within 8 months of the effective date of this permit, the permittee shall complete and submit an economic feasibility and cost/benefit study which evaluates and compares the environmental benefits and worth with the expense of installing and operating additional or alternative treatment facilities for the further reduction of TRC and TSS in the discharge to Fields Brook.

sent to Joe Holman
via telecopier 9/18
BM

Re: RMI Company
Sodium Plant
Industrial Waste
Proposed Discharge of Salt Evaporator Water

Mr. Joe T. Holman
Supervisor - Environmental Control
P.O. Box 269
1000 Warren Avenue
Niles, Ohio 44446

February 14, 1984

Dear Mr. Holman:

This office has received your letter of January 31, 1984, concerning the above referenced project. We understand that for a period of approximately six months the company proposes to discharge a seven gallon per minute purge stream from its salt evaporator. Discharge will cease when an alternate reclamation or disposal method is implemented.

The waste proposed for discharge is 25% sodium chloride solution; the sodium chloride itself contains the following impurities:

Aluminum	<0.02 %
Boron	0.010%
Barium	0.09 %
Calcium	2.04 %
Iron	<0.005%
Magnesium	0.24 %
Silicon	0.032%
Titanium	0.011%
Sulfates	768.9 ppm
Water, entrapped (moisture)	3.90 %

Your calculations indicate that addition of this waste to your existing effluent will not violate any current or proposed NPDES permit limitations. Results of your calculations are as follows:

	Flow	Total Dissolved Solids	
		Concentration, mg/l	Loading, kg/day
Present	3.2 MGD	700	8,400
Proposed	3.2 MGD	1650	19,900
NPDES Permit Proposed Limits	--	2000	49,270

CITY OF ASHTABULA, OHIO
MUNICIPAL BUILDING
4400 MAIN AVENUE
PHONE 216-997-5791

September 20, 1983

Permit and Approval Section
Ohio E.P.A.
P.O. Box 1049
Columbus, Ohio 43216

To Whom It May Concern:

The City of Ashtabula requests public hearings on the following permits and permit renewals:

1) OEPA Permit No.: 3IE00012*AD
   Public Notice No.: OEPA-83-09-027
2) OEPA Permit No.: 3IE00017*CD
   Public Notice No.: OEPA-83-09-027
3) OEPA Permit No.: 3IE00013*DD
   Public Notice No.: OEPA-83-09-028
4) OEPA Permit No.: 3PE00002*DD
   Public Notice No.: OEPA-83-09-022

The nature of the issues raised for the first three (3) above permit requests is as follows:

All of the afore mentioned companies are discharging either directly or indirectly into Fields Brook. As most divisions of the OEPA are aware, Fields Brook is already severly polluted with toxic and highly polluted material and is currently on the "Top 10" list of Superfund hazardous waste sites. This brook also discharges into the Ashtabula River which cannot be dredged and open-lake dumped because of its polluted condition.

The nature of the issues raised for the fourth permit request is as follows:

It has been the intent of this City to allow the citizens an opportunity to speak-out on the problem of water pollution in the City of Ashtabula. It is also the City's intent to be non-discriminatory, and therefore, the above request.

Respectfully submitted,

David A. Reece /fm

David A. Reece
Ward I Councilman
Chairman of Harbors, Rivers & Wharves Committee

DAR/***

RMI - Sodium & Chlorine Plant

1. Total Suspended Solids (TSS)

   A. Justification for limits - BPJ, EEQ.

   NET limits - see company monitoring data. When TSS value is > 40 mg/l, company reports intake value, which is highly variable due to its source (Lake Erie). Reported intake values range from 18 - 63 mg/l - NET limits needed as much of discharge is NCCW.

   B. 1981 & 1982 company [redacted] monitoring data (peak production) show flow volumes as high as 7.1 MGD. Highest volume reported in 1983 is 4.0 MGD.

2. Total Residual Chlorine (TRC)

   A. Water quality data at E. 15th St. (downstream Fields Brook) has shown no significant TRC problems in last 2 years.

   B. Historical data from company for catalytic treatment system effluent shows avg. of 5 mg/l TRC - company adamant about not reporting this on MOR's.

   C. No data available on lagoon system effluent prior to mixing with NCCW.

INTER-OFFICE COMMUNICATION

TO Bob Phelps, IWW, CO DATE 8-25-83

FROM: Kelvin Rogers, IWW, NEDO

SUBJECT: NPDES PERMIT 3IE00012AD FOR RMI Co.- SODIUM PLANT, ASHTABULA.

PLEASE PROCESS THE ATTACHED PERMIT. THE COMPANY WOULD LIKE THE FOLLOWING CHANGES MADE TO MY DRAFT:

1. RMI WOULD LIKE TO ELIMINATE MONITORING & REPORTING REQUIREMENTS FOR STATION 601. THIS STATION IS MONITORED ALREADY AT THE PLANT, WITH RECORDS KEPT FOR OUR REVIEW. THEY DO NOT WISH TO MAKE THE ANALYTICAL RESULTS OF THIS MONITORING PART OF THE PUBLIC RECORD. THIS IS THE MAJOR SOURCE OF TREATED PROCESS WASTEWATER TO THEIR POND SYSTEM AND DOES NOT EXPERIENCE MUCH VARIABILITY IN DISCHARGE WHEN OPERATING (3-4 DAYS/WEEK). ALSO, THERE ARE NO LIMITATIONS PROPOSED FOR THIS STATION. I CAN TAKE OR LEAVE THIS ONE.
2. RMI WOULD LIKE QUARTERLY SAMPLING FOR BOD & TSS AT 602. THEY HAVE LESS THAN 15,000 GPD CURRENTLY AT THIS STATION. OUR POLICY CALLS FOR MONTHLY MONITORING MINIMUM.

I WILL CONTACT YOU MONDAY IF ANY MAJOR CHANGES OCCUR IN THE COMPANY'S OPERATING STATUS.

7-16-85
3:14 pm

Possible sources for info.
on Ashtabula Sites.

Audobaun Society - 216-267-7111

U.S. Fish + Wildlife Div.
3990 E. Broad St.
Columbus Ohio 43216-5000

Harold Inman - Driller of wells
in Ashtabula 216-576-3526

Co. Engr William Clutter
216-5769090

US Fish + Wildlife Service
Kent Knoonmeyer Field Super.
Henry Bell Contaminant Biologist

5

DETERMINATION OF HEXACHLOROBENZENE

IN WATER

FOR

RMI COMPANY
SODIUM PLANT

Ashtabula, Ohio
February, 1977

By: Environmental Research Group, Inc.
Cleveland, Ohio

INTRODUCTION

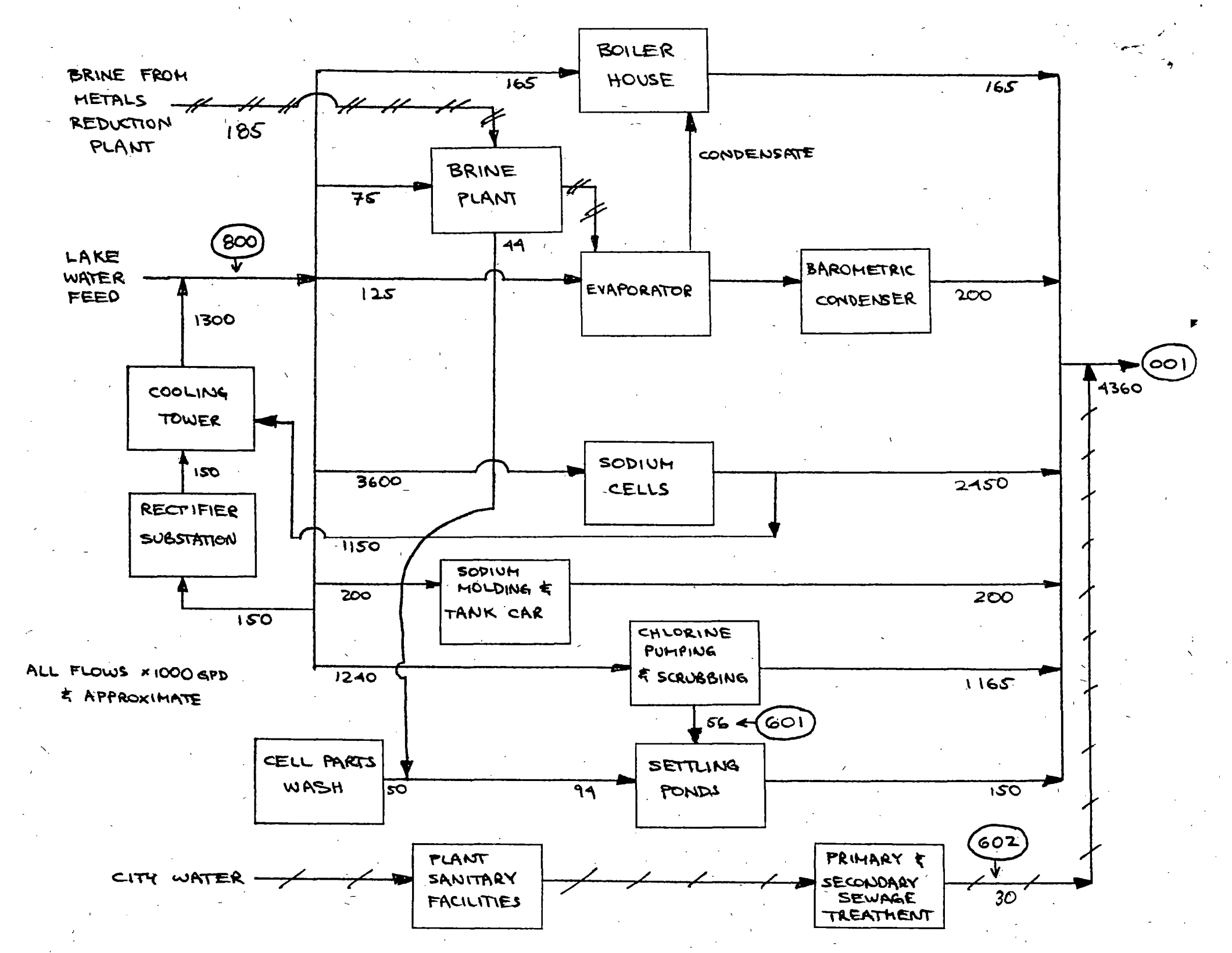
Environmental Research Group, Inc. was retained by the RMI Company to perform analysis for hexachlorobenzene content in water samples collected from various sources at the RMI Sodium Plant in Ashtabula, Ohio. Sample collection was accomplished by plant personnel under the direction of RMI representative, Thor Anderson. A 150 ml sample was obtained on an hourly basis to provide a composite for the time period sampled. Analysis was performed at the ERG, Ann Arbor laboratory under the direction of Dr. Richard Copeland.

PRESENTATION OF RESULTS

The results of our testing program are summarized in Table I.

Analysis of the 24-hour composite effluent sample (#1384) by gas chromatography showed a major peak corresponding in retention time to hexachlorobenzene. Quantification of this peak on the basis of HCB yielded a concentration of 3.7 µg/liter (Figure I). Since this was considered to be higher than what would have been expected, it was recommended that further analysis be performed using GC-mass spectrometry. This technique confirmed the presence of HCB, but at a much lower level (.22 µg/liter),(Figure III). This result indicated the probability of a contaminating substance which had interfered with the gas chromatography analysis. For this reason, a second composite (6-hour) effluent sample (#1419) was collected and submitted to ERG. Analysis of this sample by gas chromatography showed that the size of the spurious peak was considerably smaller, and a shoulder appeared on the peak corresponding to the exact retention time of hexachlorobenzene. Temperature modification of the GC allowed for sufficient separation to take place to quantify HCB at a level of .24 µg/liter (Figure II).

Although the existence of a contaminant seems apparent, the identification of this compound has not been attempted. Based upon the mass spectrometry data on the first effluent sample and the gas chromatography analysis of the second sample, we believe the concentration of hexachlorobenzene in this source to be 0.2 µg per liter.


BRINE FROM METALS REDUCTION PLANT
185
165
BOILER HOUSE
165
CONDENSATE
BRINE PLANT
75
49
800
LAKE WATER FEED
125
EVAPORATOR
BAROMETRIC CONDENSER
200
001
4360
1300
COOLING TOWER
150
RECTIFIER SUBSTATION
3600
SODIUM CELLS
2150
1150
200
SODIUM MOLDING & TANK CAR
200
150
CHLORINE PUMPING & SCRUBBING
1240
1165
56
601
ALL FLOWS ×1000 GPD
& APPROXIMATE
CELL PARTS WASH
50
99
SETTLING PONDS
150
CITY WATER
PLANT SANITARY FACILITIES
PRIMARY & SECONDARY SEWAGE TREATMENT
602
30

FROM 3/27/81 REPORT, MANZARDO

SAMPLING FROM 8-26-80 TO 11-25-81

TOXIC ORGANIC POLLUTANTS AT RMI - SODIUM PLANT

601

HCB - UP TO 4.2 ppb

CHLOROFORM - UP TO 360 ppb

METHYLENE CHLORIDE - UP TO 3.9 ppm

1,1,2 - TRICHLORO - 2,2,1 - TRIFLUOROETHANE - 110 ppb

1,1,2 - TRICHLORO - 2,2,1 - TRIFLUOROMETHANE - 150 ppb

TRICHLOROFLUOROMETHANE - 500 ppb

001 Final Effluent

HCB - UP TO 0.76 ppb

CHLOROFORM - UP TO 30 ppb

METHYLENE CHLORIDE - UP TO 3.9 ppm

refrigerant 1,1,2 - TRICHLORO - 2,2,1 - TRIFLUOROETHANE - 160 ppb

TRICHLOROFLUOROMETHANE - 13 ppb

BROMODICHLOROMETHANE - 90 ppb

PROPOSED WQS CRITERIA 11-28-80

HCB - 50 ppb - CHRONIC TOXICITY

CHLOROFORM - 1,240 ppb - CHRONIC TOXICITY

BAKER, HOSTETLER & PATTERSON
1977
UNION COMMERCE BUILDING
CLEVELAND, OHIO 44115
(216) 621-0200
TWX: 810 421 8375
OFFICE OF THE DIRECTOR OHIO EPA
IN WASHINGTON
BAKER, HOSTETLER, FROST & TOWERS
818 CONNECTICUT AVE., N.W.
WASHINGTON, D.C. 20006
(202) 857-1500

Andy Turner

No permit in effect

July 26, 1977

Mr, David Kee, Acting Director
Enforcement Division
U. S. Environmental Protection
Agency, Region V
230 South Dearborn Street
Chicago, IL 60604

Re: Notice of Violation, RMI Company Sodium Chlorine Plant, Ashtabula, Ohio -- Docket No. V-W-77-Nov-61

Dear Mr. Kee:

Please be advised that Finding No. 3 set forth in the Findings and Notice of Violation referenced above is in error. Section 301(b)(1) of the FWPCA requires that dischargers achieve certain effluent limitations defined either by regulations or by the Administrator or Director. The inorganic chemical industry regulations defining BPT and BAT limitations for sodium chlorine manufacturers, among others, were remanded to the Agency by the 4th Circuit Court of Appeals in the case of E. I. DuPont deNemours, et al. v. EPA. 541 F.2d 1018 (4th Cir. 1976) aff'd. in part and rev'd in part U. S. Sup. Ct. 45 Law Week 4212 (Feb. 1977). New regulations have not as yet been promulgated. The Director of Ohio EPA has not defined best practicable treatment for the RMI sodium chlorine plant even though application for permit was made in a timely fashion by the RMI Company with respect thereto. The proposed permit issued by the Ohio EPA was challenged by the applicant, an adjudication hearing was held and the Director has yet to rule on that proceeding.

In the meantime, the Company has proceeded with a program to reduce chlorine discharges into Fields Brook, On February 15, 1977 the Ohio EPA issued a permit to install and approved plans and specifications for a Phase I and Phase II chlorine removal program. Both phases will be complete by January of 1978 and at that time the Company will have in operation best available treatment economically achievable. Since neither the Director of Ohio EPA nor the Administrator of U. S, EPA has defined best practicable treatment currently

c Northeast District Office
UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION V
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

Dennis - FYI - Regs
Note - Columbus will handle response directly.

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

JUL 8 1977

RECEIVED
'77 JUL 12 AM 8 41
OFFICIAL FILE COPY
OHIO EPA

Mr. Ned E. Williams, Director
Ohio Environmental Protection Agency
Post Office Box 1049
Columbus, Ohio 43216

Re: Notice of Violation
RMI Company
Sodium and Chlorine Plant
Ashtabula, Ohio

Dear Mr. Williams:

The enclosed Notice of Violation sets forth the findings by the United States Environmental Protection Agency, Region V (U.S. EPA) that the RMI Company, Sodium and Chlorine Plant, is in violation of certain provisions of the FWPCA.

This Notice of Violation is issued pursuant to Section 309(a)(1) of the FWPCA. If the State does not commence appropriate action within thirty (30) days subsequent to notification, the U.S. EPA may undertake appropriate action pursuant to Section 309(a) of the FWPCA.

If you have any questions, please contact Mr. Leon F. Acierto of my staff at (312) 353-2110.

Very truly yours,

David Kee, Acting Director
Enforcement Division

Enclosure a/s

cc: Mr. Harold G. Degitz
Vice President of Operations
RMI Company

Mr. Joel Taylor, Chief
Environmental Law Section
Office of Ohio Attorney General

BEFORE THE

OHIO ENVIRONMENTAL PROTECTION AGENCY

In the Matter of:	:	Case No. 75-WD-121
RMI Company - Sodium Plant	:	Final Findings of Fact, Conclusions of Law, and Orders

BOILERPLATE 11

FINDINGS OF FACT

[These Findings of Fact generally agree with those of the Hearing Examiner. Findings of Fact No. 9, however, omits any reference to the Director's motives or mental processes in withdrawing the July 18, 1974, permit. Finding of Fact No. 10 omits reference to the basis of the chlorine limitations in the November 18 permit. Findings of Fact Nos. 16 and 27 disagree with those of the Hearing Examiner.]

1. RMI Company owns and operates a 25-year-old plant located in Ashtabula, Ohio. The plant produces sodium metal and chlorine by the Downs Cell Process in which molten salt is broken down electrolytically into its constituent elements of sodium and chlorine.

2. The Sodium Metal Plant utilizes as a raw material salt contained in a brine solution which is a waste by-product of the RMI Metal Reduction Plant located nearby.

3. During the production of sodium metal, waste chlorine gas is generated that cannot be discharged to the atmosphere. This waste chlorine gas is discharged to lime scrubbers and lime pits where it is chemically converted into an aqueous solution of calcium hypochlorite and calcium chloride. The calcium hypochlorite forms the chemical basis for the chlorine residual in the Applicant's effluent.

4. The calcium chloride and hypochlorite solution from the scrubbers and pits flows through a series of five settling ponds with an aggregate holding capacity of between 5 and 5.5 million gallons. The flow rate from these ponds varies between 50-250 G.P.M. and retention time varies between 10-70 days depending upon production levels.

5. As the hypochlorite (chlorine residual) wastes pass through the settling pond system they are subject to decomposition by natural ultraviolet radiation. The rate at which such decomposition takes place varies widely with such unpredictable factors as the amount of sunlight present, temperature, chlorine loading, and time of detention in the ponds. The range of residual chlorine concentrations flowing from the last of the settling ponds varies from less than one part per million to three thousand parts per million depending upon the above factors.

6. The effluent from the settling ponds discharges into a 36" sewer pipe where it is mixed with other process and cooling water discharges from the plant. The total combined flow of wastewater at this point varies between 5.0 and 5.9 million G.P.D. This combined flow is discharged through a 48" sewer to Fields Brook. Concentrations of residual chlorine flowing into Fields Brook from the sewer pipe range from less than 1 to 200 + parts per million.

7. Residual chlorine is currently present in Fields Brook in substantially greater concentrations immediately downstream from the Applicant's outfall than are present upstream from this outfall. Downstream concentrations range from non-detectable to 74 mg/l.

8. On July 18, 1974, the Ohio EPA issued to the Applicant RMI Company--Sodium and Chlorine Plant proposed NPDES Permit E 312 *AD. The proposed permit contained the following effluent limitations on residual chlorine discharges from outfall serial number 001:

From	To	Daily Avg.	Daily Max.
Oct. 24, 1974	May 31, 1977	---	200 mg/l
June 1, 1977	Sept. 30, 1978	50 mg/l	75 mg/l
Oct. 1, 1978	Aug. 31, 1979	2.0 mg/l	5.0 mg/l

Alternative effluent limitations were stated for a treatment option providing for removal of chlorine wastes to a municipal sewage treatment plant.

The Fact Sheet issued with this permit stated that the receiving water is classified as a low-flow stream and that the effluent limitations are based upon best available treatment.

9. The proposed permit issued July 18, 1974, was withdrawn by the Director on October 21, 1974.

10. On November 18, 1974, the Ohio EPA issued to the Applicant RMI Company--Sodium and Chlorine Plant, proposed NPDES Permit E 312 *AD. The proposed permit contained the following effluent limitations on residual chlorine discharge from outfall serial number 001:

From	To	Daily Avg.	Daily Max.
Dec. 31, 1974	May 31, 1976	---	200 mg/l
June 1, 1976	June 30, 1977	50 mg/l	75 mg/l
July 1, 1977	Aug. 1979	0.1 mg/l	0.3 mg/l

Alternative effluent limitations were stated for a treatment option providing for removal of chlorine wastes to a municipal sewage treatment plant.

The Fact Sheet issued with this permit states that the receiving water is classified as a low-flow stream and that the effluent limitations for residual chlorine are based upon best available treatment.

The effluent limitations in this permit are based upon water quality standards. The statements in the Fact Sheet that the residual chlorine limitations are based upon Best Available Treatment are erroneous.

11. On December 16, 1974, Applicant RMI filed a request for an adjudication hearing with respect to the proposed permit of November 18, 1974.

12. In the absence of industrial discharges of wastewater, Fields Brook would be a dry stream in the dry weather months. The majority of its flow is due to the introduction of between 10 and 11 million gallons of wastewater per day from industrial dischargers. The receiving water has been treated by the Ohio EPA as a low-flow stream.

13. In its present state Fields Brook is biologically depressed in that it is not supporting normal diverse communities of living organisms. An extremely toxic condition presently exists in Fields Brook downstream from the RMI Sodium Plant discharge at outfall number 001.

14. If all industrial pollutants were eliminated from Fields Brook while maintaining an augmented flow, the lower reaches of Fields Brook would be capable of supporting and sustaining warm-water macroinvertebrate populations and some species of warm-water fish. Under these conditions, Fields Brook would support bottom organisms at levels of approximately thirty or forty pounds per acre. These bottom organisms would support warm-water fish to the extent of three to four pounds per acre. The 3-1/2 acres of Fields Brook would support a total fish population of 10 to 20 pounds. These fish would not be larger than 3 to 5 inches. Under these conditions, the fish life in Fields Brook would be of no commercial value and of recreational interest only to children. The upper reaches of Fields Brook, which are not subject to flow augmentation from industrial discharges, are now, and will be in the future, capable of supporting only those species of macroinvertebrates and fish which are adapted to periods of virtually zero flow or which are capable of survival in residual pools. These species have no commercial or recreational value.

15. A well-balanced warm-water fishery of substantial recreational value would typically contain some of the following species: large and small mouth bass, yellow perch, walleye, northern pike, golden shiner, sunfish, bullheads, black bowhead and minnows. These fish would exist in quantities from 100 to 200 pounds of fish per surface acre.

16. Water flowing from Fields Brook into the Ashtabula River does not cause the Ashtabula River to violate any water quality standards, including those for residual chlorine. The measurable effect of the inflow from Fields Brook extends downstream from the confluence of the two water courses to the Fifth Street Bridge. The evidence is equivocal on the question of whether the current existing level of discharge of industrial wastewater into Fields Brook has caused damage to bottom fauna in the Ashtabula River. It appears to the Director that there most likely is some adverse effect, though the evidence on this point is not nearly as clear as the Hearing Examiner concluded. The flow from Fields Brook does not constitute a detrimental effect on the Ashtabula Harbor or Lake Erie. Reduction of the chlorine content of the RMI effluent would probably have some beneficial effect upon water quality or aquatic biota in the Ashtabula River, though the evidence is not clear on this question. There is little or no reason to believe that compliance with the limitations in the November permit would provide substantial environmental benefits that compliance with the July permit would not also produce.

17. The calculated safe concentration for warm-water fish continuously exposed to chlorine residuals is 2×10^{-2} mg/l. This is based upon one-tenth of the 96 hour median tolerance limit for such species as determined by bioassay procedures. The effluent limitation in the November 18th proposed permit is based on the assumption that 4×10^{-2} mg/l of chlorine residual in the stream complies with Ohio's water quality standards.

18. The attainment of the final effluent limitations of 2 mg/l chlorine residual as a daily average in the July 18th permit will eliminate nuisance odors caused by residual chlorine in Fields Brook, and such discharges will not otherwise be a threat to public health and safety.

19. The RMI Sodium-Chlorine Plant differs from the other four sodium-chlorine plants in the following respects:

    a. The raw material for the Applicant's process is waste brine from its titanium metals plant, necessitating the operation of a brine evaporator.

    b. The Applicant's plant uses water from Lake Erie as its source of cooling water.

    c. The Applicant's plant is not part of an integrated chemical production complex capable of utilizing the waste stream from the sodium-chlorine plant in other productive processes.

20. The factors identified in Findings Nos. 19(a) and (b) above affect only the suspended solids loading of effluent. The suspended solids loadings are not in issue in this litigation.

21. The factor identified in Findings No. 19(c) does affect the number of options immediately available for treating the chlorine residual in the Applicant's waste stream.

22. The Applicant has proposed a two-phase control strategy for the reduction of residual chlorine discharges from its Sodium Plant. Both phases of this control strategy involve the use of unique proprietary installations which have no known counterparts in other sodium-chlorine plants.